THE IRON AGE

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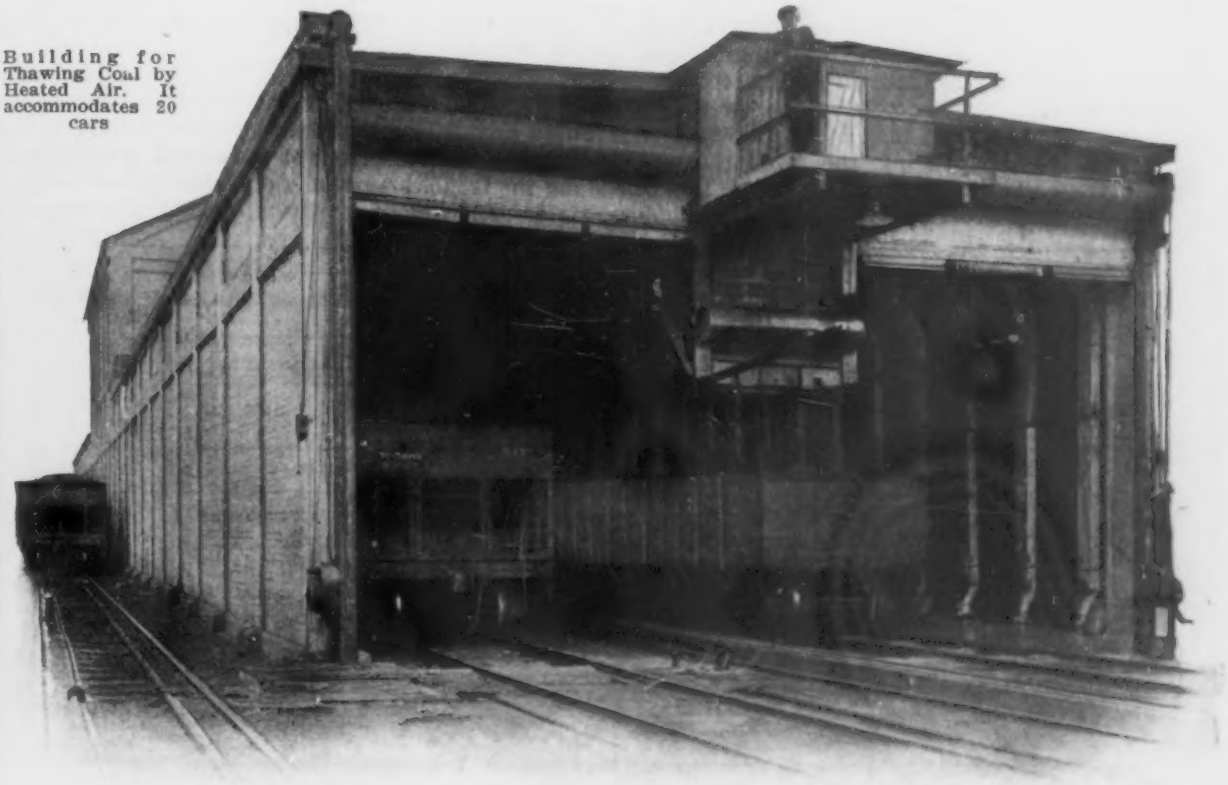


Building for Thawing Coal by Heated Air. It accommodates 20 cars

Late Addition to Youngstown Coke Plant

Thaw House for Frozen Coal—New Method of Handling Spillage After Leveling—Two Batteries of Ovens Added to Original Installation

THE Youngstown Sheet & Tube Co., Youngstown, Ohio, which has had four batteries of coke ovens in operation since August, 1916, started work in July, 1917, on a 50 per cent addition to its plant. One of the new batteries was put in operation Aug. 8 and the other Sept. 4, 1918. The original installation was described in THE IRON AGE of Dec. 7, 1916.

The two new batteries each consist of 51 Koppers cross regenerative ovens of 500 cu. ft. capacity. The coke produced is sent to the company's Hubbard blast furnaces.

The unloading, crushing and mixing equipment for the original four batteries was designed and installed with sufficient capacity for the extension. The coal is unloaded by means of a high lift Weiman-Seaver-Morgan car dumper, the first one ever installed to serve a coke plant. A 36-in. belt conveyor on 350-ft. centers and with 500 tons an hour capacity was installed from the top of the storage bin over Nos. 1 and 2 batteries to the new storage bin over the new Nos. 5 and 6 batteries. This bin is of 2000 tons capacity and has a partition so that different mixes of coal can be handled on the two batteries, and also so either side of the bin can be conveniently cleaned without interfering with operations. Clean-out manholes are provided near the top of the hopper in each compartment. The drive for the conveyor feeding this bin is located in the pent house at the top and the conveyor is interlocked electrically with the system behind it.

Owing to the fact that in order to entirely fill an oven it is necessary to pull some coal out of the chuck door when finishing leveling, it was decided to incorporate in the new work plans for handling this spillage which had been developed by the Youngstown Sheet & Tube Co. for the old batteries. Accordingly, a small bin of about three tons capacity was built on the main bin, and the coal pulled from the ovens is dropped through a chute attached to the pusher into a hopper on the pusher, and from there dropped into a hopper next to the pusher rail, whence it is carried by a cross-conveyor to a vertical bucket elevator discharging into the small bin. The operation is designed so the door extractor man on the pusher can drop the coal from the hopper on the pusher and start the conveyors from the bench level. The small bin is so arranged that the larry

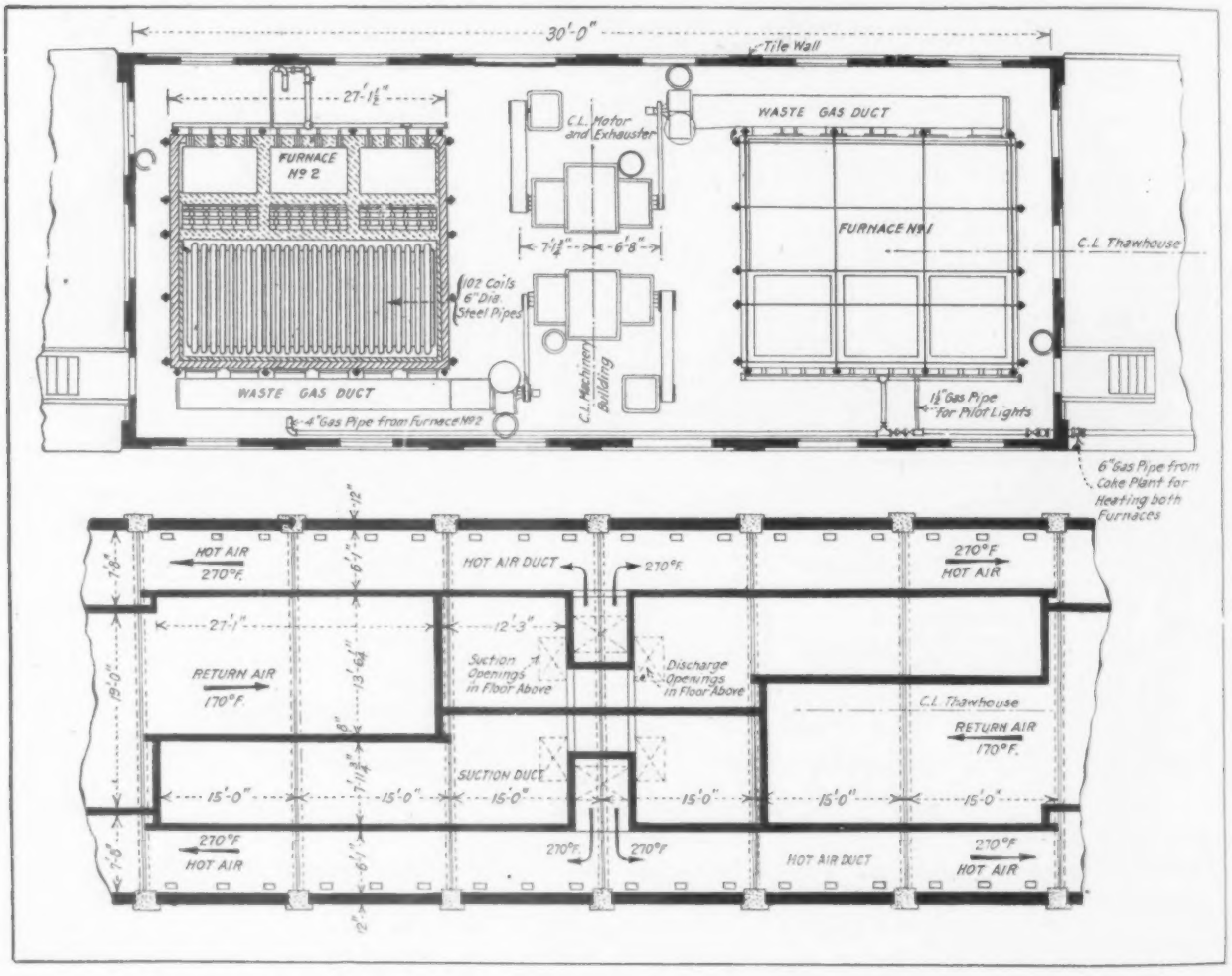
man can empty it without getting off his car. This is the first installation of its kind on a by-product coke plant.

The two larry cars are equipped with a motor-driven swab crane designed by the Youngstown Sheet & Tube Co. and are the same as installed on the three larry cars on the old batteries. The object in putting a motor on this apparatus was to make the work so easy that the larry men can attend to this duty without extra help.

Owing to the increased coal consumption due to the extension, it was considered advisable to erect a thaw house for taking care of frozen coal. The engineering department accordingly drew up plans for a thaw house 400 ft. long by 38 ft. wide, holding 20 cars and spanning the two tracks, the shunter track serving the car dumper. The construction is of reinforced precast concrete columns

off all the gas except the pilot lights when the fans are shut down accidentally or intentionally. The fans are each designed to deliver 60,000 cu. ft. of air per min. at standard conditions. The air is delivered under the cars at about 225 deg. Fahr. and after passing up along the sides and bottoms of the cars, enters the return air duct through openings in the bottom and then returns to the heating furnaces. The openings in the bottom of the return air duct are adjustable, so that an even distribution of hot air throughout the length of the building is obtainable.

The coke wharf is 125 ft. in length and is located at one end of the batteries. Considerable care was used in selecting the location of this wharf so that it would not be in front of the ovens, thereby avoiding the troubles especially prevalent in cold weather from steam along the coke side of the batteries.

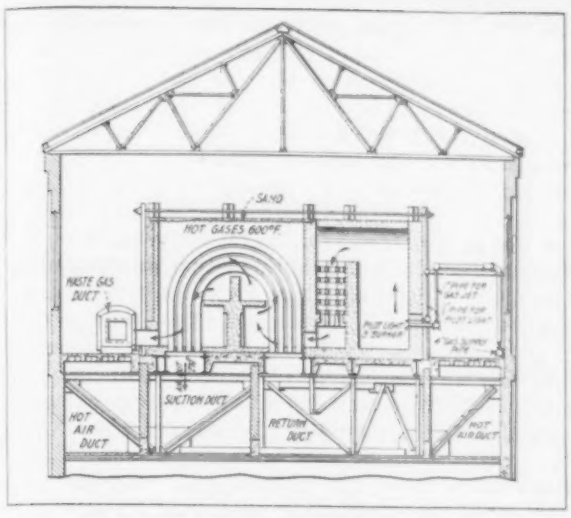


Enlarged Sections Through Machinery Building Over Thaw House Showing Layout of the Air Heating Furnaces, Accessory Apparatus and Ducts in Which Air Is Returned for Reheating

supporting structural steel trusses and the roof and machinery house. The walls between the columns are built up of Dennison interlocking hollow tile. The hot air ducts run the length of the building on both sides between the roof and the bottom chord of the roof trusses and the return air duct is between the hot air ducts. Down comers from the hot air ducts convey the heated air up under the cars every 5 ft. on both tracks the entire length of the building. The furnace and machinery houses contain two heating units and fans for delivering the hot air and exhausting the combustion gases. Temperature regulators are provided for automatically controlling the temperature of the air used in the furnaces, also recording pyrometers and thermometers. Coke oven gas is used for heating the air. Automatic control is provided for shutting

Two General Electric locomotives for the hauling and quenching cars are provided of the same design as the previous installation.

The quencher track is built with 100-lb. rails, wooden ties and crushed slag ballast, and is supported by a reinforced concrete bed. After the quencher track was laid accurately as to elevation and distance from the ovens the third-rail system was installed at the correct distance and elevation from the quencher track. The same design and care was used in this installation as on the original quencher track designed and installed by the company. The continuity of service of the original installation is indicated by the fact that a steam engine has never taken a heat, nor has it been necessary to haul out quencher cars or electric locomotives with a steam engine.

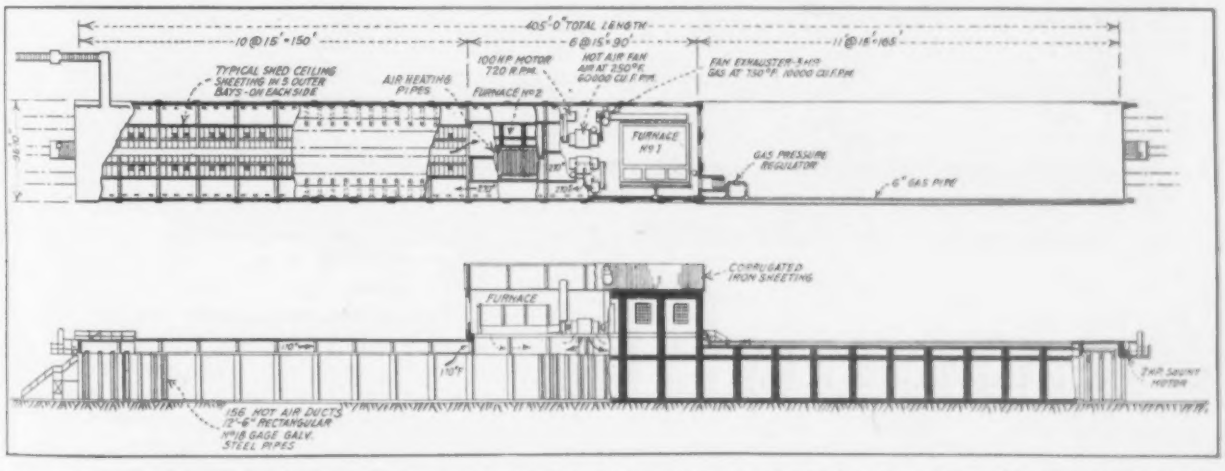


Arrangement of the Furnaces and Method of Heating Air. The hot gases circulate around arched 6-in. steel pipes containing air which comes to the furnaces in return ducts

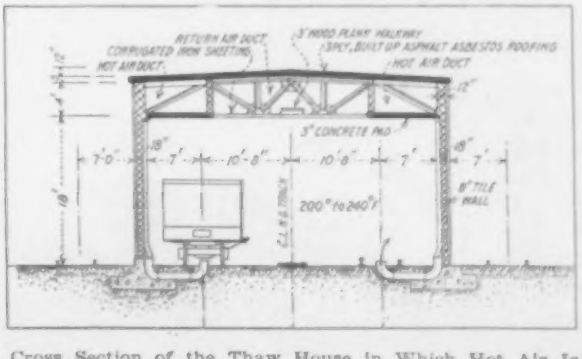
From the wharf the coke is conveyed on a 36-in. conveyor on 340-ft. centers to a new screening station erected for the new batteries. Provision is made by means of a tunnel underneath the quencher track between the wharf and the screening station, so that if in the future the company builds blast furnaces on the coke plant site, a conveyor can be installed to take the coke to a screening station over the blast furnace trestle and deliver into a transfer car running over the blast furnace bins. The coke is screened over bar grizzlies, of which there are two suspended from an overhead carriage. One is a spare and can easily be pulled into position in front of the conveyor when it is desired to remove bars of the other grizzly. As a somewhat softer coke is desired in the present operation, special attention was paid, both for the purpose of saving breakage of the coke and wear on the chutes, to the installation of coke boxes in the delivery chutes from the bar grizzlies to the railroad cars. By means of a removable coke box at the foot of the screens, coke may easily be delivered into cars on either of two tracks running underneath the screening station. The undersize from the bar screens drops on to a 20-in. belt conveyor and is delivered to a revolving screen in which the separation is made into domestic and breeze, these products being delivered into cars on respective tracks underneath the station. Both the bar grizzlies and the revolving screen are the same design as installed in the original screening station. At this station coke, after being screened and delivered into small receiving bins, is conveyed over the river on a trestle to the blast furnace bins by means of a 35-ton electrically-driven transfer car. All chutes are lined with hard brick laid on edge, and the sides of the chutes are lined with chilled cast-iron plates. In both the new coal-handling and coke-handling system glass windows are practically eliminated and steel louvers substituted. Owing to the fact that the wharf had to be located below the sewer level, an automatic electrically-operated bilge pump is installed to take care of drainage water. A car-pulling winch able to handle 12 loaded cars and serving both the coke-loading tracks, is installed to spot empties and move away the loads.

A brick quenching hood 58 ft. high is provided. Steel baffles inside of the hood return any coke which may fly into the air on quenching, back into the quencher car. All concrete foundations for the hood which might come in contact with water from the quencher car are veneered with brick. The same type of Drave-Doyle solenoid-operated balanced quenching valve, which the company was the first to adopt for this use, is installed in the new quenching station in the same manner as in the old station.

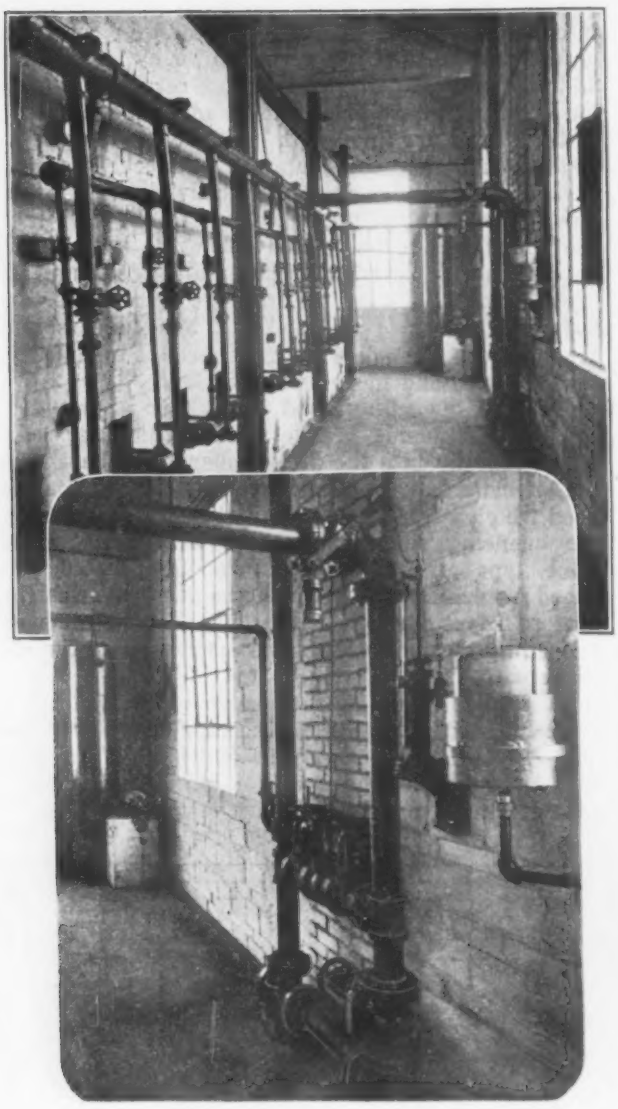
Except for lowering the horizontal flue 2 in. there is practically no change in the new ovens over the old. In both cases the oven width is 17 in. and 19½ in., or an average of 18¼ in. It was considered desirable, primarily on account of the men in hot weather, to insulate the regenerator end walls. Accordingly the company conducted some exhaustive tests in a specially built furnace, on a variety of insulating materials, finally selecting a moderate-priced grade of infusorial earth which was put in between the fire brick and the red brick closing the



Plan and Elevational View of Thaw House and Central Machinery Building, the Latter Containing Two Gas-Burning Furnaces, Air-Heating Pipes, Fans, Motors, etc.



Cross Section of the Thaw House in Which Hot Air Is Brought from the Ducts at the Top of the Building Down Through Wall Ducts and Released Directly Under the Cars Contaning Frozen Coal. There are 156 of these air ducts



Gas Regulating and Control Apparatus of the Air Heating Furnaces

face of the regenerators. The pusher machines, built by the Wellman-Seaver-Morgan Co., are practically the same as on the original installation, including the automatic reciprocating motion of the leveller. The cast-steel end trucks are provided with countershaft bearings on both sides so that the end trucks are interchangeable, and but one spare need be carried for both trucks. The ovens, pusher walls, coal bin and concrete battery stacks are carried on Raymond concrete piles.

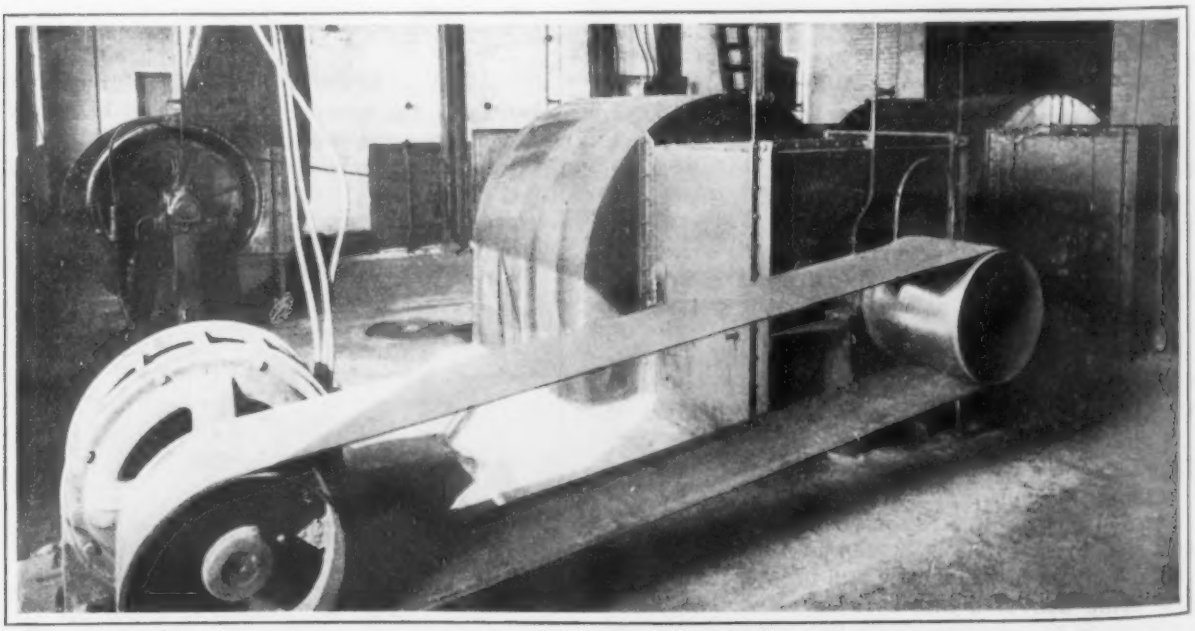
By-Product Equipment

The original installation in the by-product building consisted of three positive-type Connersville exhausters delivering through tar extractors and preheaters to three large oval type saturators, one unit being a spare. Two positive-type Connersville boosters were provided for delivering surplus gas to the mills, one being a spare. The extension consists of a General Electric turbo exhauster, tar extractor, preheater and saturator and one General Electric turbo booster for the surplus gas. The gas is admitted to the continuous oval cracker pipe in the new saturator at both ends. This type of saturator was adopted in preference to the type originally built, in which the gas was all admitted at one end into two separate cracker pipes, one of which type has already been rebuilt.

The regulation of the gas in the collecting main is accomplished by governing with the turbo exhauster and Northwestern governors on the offtakes, the other exhausters being run at constant speed.

Two new primary coolers, a storage tank for weak liquors, and an ammonia still were added.

The Youngstown Sheet & Tube Co. has installed some labor-saving devices in connection with its by-product plant which are of interest. It designed and built a jib crane operating a ½-yd. single-line Brosius bucket for cleaning out accumulations in the hot drain and flushing tank. This bucket empties into a small dump car running on a narrow-gage track which delivers the material to a pit within reach of a standard railroad track where it can be gathered by a locomotive crane. By this device men are never required to enter the hot drain or flushing tanks to clean out accumulations. An interesting feature of this tank, designed by the company, is the absolute and simple control of the proportions of tar and liquor for flushing purposes. The mix is ordinarily carried at 50 per cent each, but can be varied almost instantly by one valve to



Arrangement of Air Circulating Fans and Combustion Gas Exhausters Used in Connection with Furnaces which Heat Air for the Thaw House

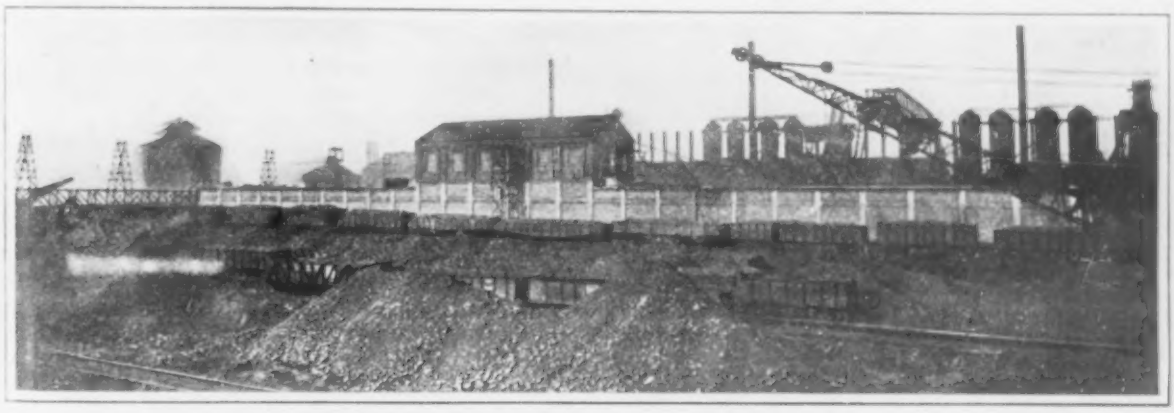
any desired proportion of tar and liquor. By means of this and other control features the primary coolers which ordinarily have to be steamed out every few days, are run from four to six weeks at a time without being steamed out, which effects considerable saving of steam, labor and deterioration, due to expansion and contraction of the large number of tubes in these coolers.

In the sulphate storage room the company has designed and built a hopper, with a chute extending through the wall, whereby bulk shipments can be made by means of the overhead crane loading into the hopper, and the salt running directly into the box car, instead of having to wheel the salt out into the car by hand. To provide for bag shipments the company built a loading hopper. Sulphate of ammonia often cakes more or less while in storage, and when loading into bags through the usual hopper it is necessary to have a man on top of the hoppers pushing the salt down. By means of its special design of toothed rolls the salt is fed into the bags without any labor at the top.

The original benzol plant was built by the Semet-Solvay Co., which also built the addition, the latter consisting of two light oil stills and one refining still, also auxiliary apparatus, wash oil coolers, gas coolers and gas scrubbers. A new acid washer building was erected entirely separate from the main benzol building and so arranged that all apparatus can very readily be taken down and removed from the building for any repairs which might be dangerous in this location. Overhead hand-operated traveling cranes are installed in both the main benzol building and the acid washer building. All new work rests on Raymond concrete piles, as was the case with the original work. In constructing the additions great care had to be exercised on account of the hazards of the industry. The concrete pile driver was furnished steam through a hose to avoid the use of the boiler. The wooden blocks under the hammer were renewed frequently and dropped into a barrel of water immediately after being removed, as at times they get so hot they burst into flame. All field work on the structural steel was bolted, no riveting being permitted on the site. The old wall of the main building was left intact except for a few bricks where the connections were made, until the new structural work was completely erected, walls bricked in, windows put in and roof put on, after which the wall was removed.

One new Babcock & Wilcox boiler was installed with Coxe traveling chain grate stokers, with which the entire boiler house is equipped. Breeze produced at the coke plant is used for fuel. Gas burners are installed for emergency use only, or for use Saturday night or Sunday when the surplus gas would otherwise be wasted.

The three Wheeler forced draft cooling towers originally installed were made large enough to take care of the extension. It is necessary in summer to use two of these towers for cooling the raw river water for use in the primary coolers and the first section of the wash oil coolers. The third tower is used for recirculating water for the first cooling of the gas leaving the by-product building and is a closed system. Cold water from a nearby reservoir is used for apparatus inside the benzol building, final cooling of the gas before the benzol scrubbers and final cooling of the wash oil, but this is reduced to a minimum by using, as far as possible, the cooling tower water as a preliminary step.



Side View of the Thaw House. Its total length is 400 ft.

Contracting for Coke on Sliding Scale Basis

UNIONTOWN, PA., June 24—Tightening of the coke market and the annual debate over the signing of contracts, first signs of a labor shortage, inquiries for by-product coal and the fact that blast furnaces are being put into blast again, are unmistakable indications that the coal and coke industry has taken a marked stride on the up-grade. Furnace operators are seeking to close contrcts for the last half of the year, but generally speaking there has been little success, although a few short term contracts have been made at around $3.50 and $3.90. With other contracts, the most popular plan now is a sliding price scale with the ratio from five and a quarter to one to six to one on the price of pig iron, the prices to be determined month to month during the period of the contract. Blast furnaces which are to resume operations during July and the first of August are persistent seekers of low scale contracts, but the Fayette county operators, holding the whip hand, are maintaining their stand to secure what they claim equitable prices to prevent any changes in wage scales and yet insure a fair profit during the rest of the year. There is very little spot coke on the market and what there is brings around $4.

During the past week, approximately 450 ovens have been put in blast in widely scattered sections of the Fayette county region.

There have been numerous inquiries during the week for by-product coal, but so far as reported no worthwhile contracts have been placed. The steam coal output for the month has been pretty well contracted but a flurry in the market is expected this week, inasmuch as these operations are almost exclusively upon a month to month basis.

DEFECTIVE FORGINGS

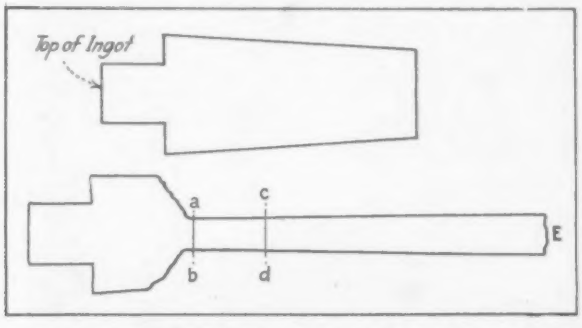
Results of Finishing at Too High and at Unequal Temperatures

BY O A. KNIGHT*

In visiting various plants which were having more or less difficulty with heavy forgings, the writer recorded the following notes which, it is believed, will explain many of the troubles observed. There seem to be two common sources of trouble, which are: Finishing at too high a temperature and finishing at unequal temperatures. The former has been freely discussed in the past and the latter to a lesser extent.

Finishing at Too High a Temperature

The effects of finishing at too high a temperature are too well known to merit discussion here. An attempt is made, however, to point out the reason why certain forgings are finished at too high a temperature even though the evil effects are known and steps taken to prevent such occurrences.



The Original Ingot and Its Shape After a Certain Reduction in Forging

It is customary now for maximum and minimum temperatures to be specified above which the metal should not be heated for forging and below which it should not be forged. The writer has come in contact with a number of plants in which the steel was not supposed to be heated above 1250 deg. C. prior to forging, or forged below a good red heat (775 or 800 deg. C.). In many instances these requirements were complied with in full, and yet the steel was finished at too high a temperature. This occurs in the following manner:

The original ingot is heated to 1250 deg. C., withdrawn from the furnace and forged until, in the opinion of the forgeman, it should be reheated before being worked further. He then reheats to 1250 deg. C. and continues forging. With the second heating, or possibly the first, the forging was worked almost to size but not quite, and lest it be forged too cold in an attempt to finish it without again heating, it is put back in the furnace and reheated to 1250 deg. C. as usual. After reaching that temperature it is removed and forged to finished size in a short period of time, since only a small amount of reduction is required, and laid aside to cool from a temperature of from 1100 to 1150 deg. C.

This results in the development of a large grain structure, which in many cases fails to be completely broken up by the subsequent heat treatment. Had sound judgment been used in heating for the final finishing work it would have only been heated to, say, 1050 or 1100 deg. C., whereupon it would have been finished at 850 or 900 deg. C., for example, and the above trouble avoided. To avoid such occurrences requires the constant attention of the foreman and often such points as this are neglected.

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Finishing at Unequal Temperatures

Finishing at unequal temperatures occurs with heavy forgings such as gun tubes. The writer has witnessed the following procedure in the manufacture of such forgings. The original ingot is placed in the forging furnace, generally already preheated to some 800 deg. C. and heated to a good working temperature of, say, 1200 or 1250 deg. C. It is then withdrawn by means of a chuck or other suitable device which grasps the tonghold and the other end is then forged under a press or hammer until it has the shape shown by the illustration. The portion from the line *a b* to the end *E* is practically to finished size, the bottom discard beyond *E* has been cut off. The entire piece is then turned around and the remaining heavy end placed in the furnace to heat for forging. It generally so happens that the finished portion as far as the line *c d* is exposed to the high temperatures of the furnace during the period required to heat the heavy section to a good forging temperature. The piece is then removed and forged to size, the top discard cropped and the forging laid aside for annealing and subsequent heat-treatment.

The result is that the portion of the finished forging between the lines *a b* and *c d* was exposed to a temperature of some 1250 deg. C., during the time required to heat the heavy section to that temperature for forging and the portion between *a b* and *c d* is not forged after this heating. The result is that an abnormally large grain structure is formed in this portion which has no opportunity to be broken up by forging. There is a region, therefore, in the central portion of the forging which has this abnormal structure, whereas both ends have a well-refined grain. This central portion never does succumb to the subsequent heat treatment in the same manner as the rest of the forging, and is a source of weakness.

The very bad feature of a defect of this kind is due to the fact that it is not detected by the ordinary method of taking physical test specimens from both ends of the forging which may give excellent properties. The forging is placed in service where it fails later on. To avoid this, it is obvious that the portion between the lines *a b* and *c d* should be left considerably oversize so that it will receive considerable forging along with the heavier section.

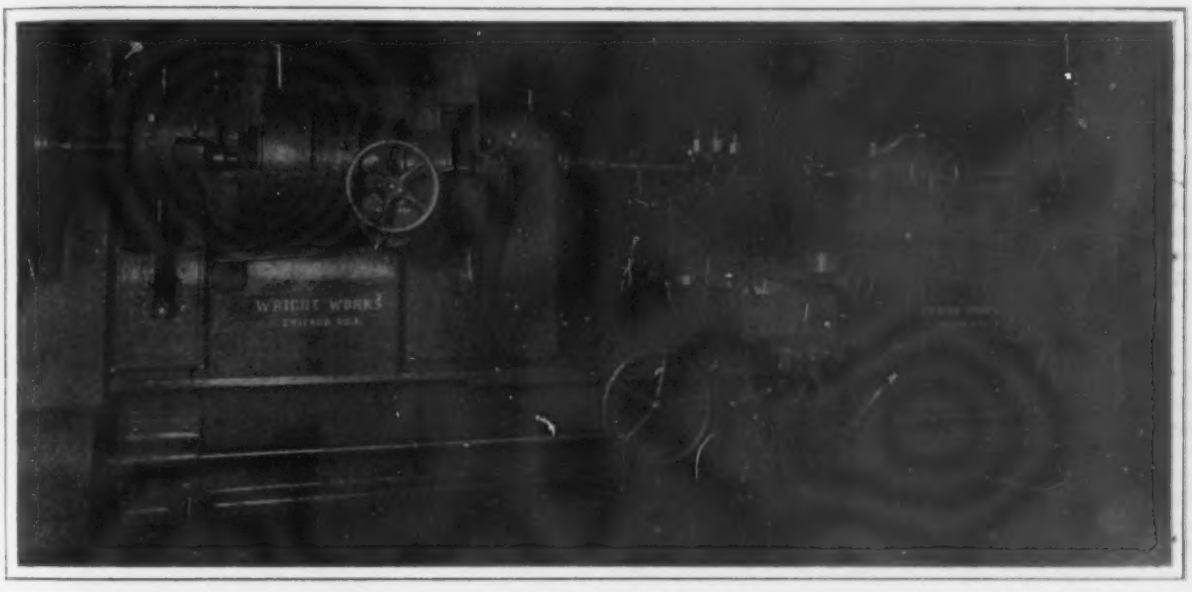
The annual meeting of the Biwabik Mining Co. was held May 27 in the company's offices in Youngstown, Ohio, and directors and officers chosen for the fiscal year. The company is a subsidiary of the Brier Hill Steel Co. Directors elected are W. A. Thomas, George F. Alderdice, Fred Tod, J. B. Kennedy, E. L. Ford, W. W. Blackburn and D. G. Kerr. Mr. Tod succeeds the late H. H. Stambaugh on the board. Directors elected the following officers: W. A. Thomas, president; G. F. Alderdice, vice-president; Frank Billings, secretary, and N. B. Folsom, treasurer.

The United States Training Service, Department of Labor, 618 Seventeenth Street, N. W., Washington, has issued an illustrated bulletin entitled "Efficient Training in a Large Plant." The system described is in operation in an Eastern plant, sometimes employing 10,000 men. More than 250 plants have similar training departments. The employees are divided into groups of six to an instructor, and are assigned to the 80 machines. By this method it is claimed only half the usual "breaking in" time is required. Old employees are also up-graded in this school.

A 96-inch Engine Lathe

The large lathe illustrated is a triple-geared Fifield with 96-in. swing recently produced by the Wright Works, 1150 South Washtenaw Avenue, Chicago. The machine is cone driven from a backshaft, this procedure being necessary to obtain enough power to take the heavy cuts. An 8-in. belt from a countershaft running at 200 r.p.m. transmits 40 hp. to the spindle of the lathe. To reduce chattering, the spindle is made of cast iron, which being less elastic than steel reduces spring on heavy cuts. To compensate for the strength of steel, the spindle is made large, the front bearing being 16 in. in diameter and 24 in. long and the rear bearing 14 in. in diameter and 20 in. long.

All gear changes are obtained by moving the hand wheel placed in front of the cone pulley convenient to the operator. The hand wheel is geared to a lever shaft which reduces the effort required to shift the back gear. Only one of the changes is through sliding gears,



Triple-Geared Engine Lathe with 96-in. Swing. The bed is 48 ft. long and will take 34 ft. between centers. The total weight of the machine is 150,000 lb.

the balance being by large tooth clutches. All speeds are in geometrical progression, from 0.75 to 76 r.p.m. Twelve speeds are obtainable through the four steps cone pulley and triple gearing with a ratio of 1.52 between each speed.

The pitch and width of face gears increase in proportion to the load which the teeth bear in reducing the backshaft speed when turning the faceplate at slow speeds. The triple gear which engages the faceplate internal gear is of one diametral pitch and has a face width of 6 in. All shafts in the headstock run in phosphor bronze lubricated by sight feed oilers.

The feeds are also in geometrical progression and are obtained from a quick change gear box which is integral with the headstock. They are manipulated by two levers which give four speeds of 0.025, 0.050, 0.100 and 0.200 in. per turn of the faceplate. More feed may be had by changing the regular feed gears with the thread-cutting gears, and 24 different threads may be cut by means of changing gears.

The carriage is equipped with two compound slides which may be fitted with power angular feed. The carriage bears upon the ways for a length of 90 in. The lead screw is kept from buckling by supports which are adjustable and placed about 10 ft. apart.

The tailstock, like the headstock, is of box construction and is moved by hand by a geared device which engages the teeth in the rack of the bed. The tailstock spindle is moved by a hand wheel which is placed convenient to the carriage.

The bed is ribbed throughout with box sections and is fitted with a rack down a center rib which engages a pawl on the tailstock, thus to remove the thrust of a cut from the clamps of the tailstock direct to the bed of the lathe.

The Machined Steel Casting Co.

The Machined Steel Casting Co. has been organized at Alliance, Ohio, with a capital of $1,000,000 divided into 10,000 shares of $100 each. The new plant of the company will be erected on a tract of 15 acres on the Cleveland & Pittsburgh Railroad. Work on the building of the plant is to begin at once, and it is stated the shop will be in operation by Jan. 1, 1920. The main building will be 75 x 400 ft, with a 30-ft. lean-to on each side. At the south end and at right angles to the main plant will be the open-hearth building, built of the same kind of material. It will be 90 x 135 ft. and so situated that the open-hearth crane will also serve for the runway covering the stock yards. This runway will be 150 ft. in length at the starting of operations in the plant. The open-hearth equipment will consist of one 20-ton acid furnace, oil fired, but the building will be large enough for two furnaces. This part of the work, together with other buildings, are to be so arranged as to be susceptible to additions at any time desired. The building of the main structure is so arranged that one 75-ft. building can be built to the west and four or five such structures to the east of this building. The open-hearth building will be located so that future extensions may be made as may be desired. The site is regarded as an ideal one for a steel casting foundry, because of the fact that a steel casting foundry produces about one ton of refuse to every ton of finished products, and there is ample room to care for the refuse through the track equipment for many years to come. The plant will have ample switching accommodations from the Pennsylvania Lines West and the New York Central Railroad.

In the foundry there will be one 30-ton crane and one 15-ton crane. The open-hearth furnace will be provided with one 15-ton crane and the lean-tos of the main building with one 5-ton crane. The plant will be fully equipped with the most modern machinery and appliances and so arranged for future enlargements as they are needed. The company states it expects to begin with a production of 1500 tons of castings per month known commercially as miscellaneous castings, and will employ approximately 300 hands to begin, with a payroll of $50,000 per month.

At a meeting of stockholders of the new company, held on June 16, W. H. Purcell was elected president; W. E. Trump, first vice-president and general manager; F. R. Donaldson, second vice-president and sales manager; J. B. Freer, treasurer and purchasing agent; H. Y. Stuckey, secretary, and R. H. Donaldson, general superintendent. All these parties were formerly prominently connected with important industries of Alliance.

RAILROAD EQUIPMENT EXHIBIT

After Lapse of Two Years Atlantic City Show Establishes New Record

If anything were required to illustrate the optimistic attitude of those who supply the railroads with equipment it could be found in the exhibit of the Railway Supply Manufacturers Association, Atlantic City, June 18 to 25, held in connection with the convention of the American Railroad Association, the latter body embracing the former Master Car Builders and Master Mechanics' associations. The convention was the first of its kind since 1916, it not having been deemed feasible to expend energy or use equipment for either meetings or show in war times. The attendance was between 5000 and 6000. The exhibit, housed as usual on Young's Million-Dollar pier, established a new record both in regard to the number of exhibits and the space occupied, there being 301 exhibits requiring 93,500 sq. ft. of floor space. Railroad equipment, appliances and supplies were seen in profusion, the iron and steel companies were much in evidence, and there was an excellent showing of machine tools in operation, as well as forging, pneumatic and hydraulic machinery and small tools. Also of interest was the exhibit of cars and locomotives on track, these including a Pennsylvania Railroad Mallet locomotive, and hopper and gondola cars of over 100-tons capacity. The first 100-ton car to be built, placed in service in 1916, was for the Woodward Iron Co.

Showing of Improved Machine Tools

In machine tools, none of radically new design in their entirety were seen, but several of comparatively recent development commanded attention, as did others of generally familiar design, but having improved features, especially devices having to do with control devices making for greater efficiency. Manning, Maxwell & Moore, Inc., led the display in point of space occupied. A conspicuous feature of this exhibit was a 15-in. Putman crank slotting machine.

The table of the slotter has power feed and hand adjustment in every direction; cross, longitudinal, and rotary, all controlled from the operating side of the machine, and so arranged that only one feed is engaged at a time. The feeds are actuated by a cam on the crank-disk shaft, and a wide range of positive feeds is provided. All feeds are engaged when the ram is at the upper end of the stroke. The rocker arm supporting the feed pawl is held on its shaft by a friction clamp and slips, preventing breakage, should the table meet a positive obstruction.

Eight cutter-bar speeds are provided by means of a four-speed gear box and two-speed countershaft, with single pulley belt drive. The pulley is mounted on a friction clutch operated by a lever, and the act of throwing out clutch applies a brake, stopping the machine very quickly, an arrangement which avoids the use of cone pulleys.

Improved designs in bolt, nut, rivet and forging machinery manufactured by the National Machinery Co., Tiffin, Ohio, were exhibited under the auspices of Manning, Maxwell & Moore, Inc.

Also of unusual interest in the same exhibit was an internal combustion, compression ignition engine built by this same company, in which the fuel used was kerosene. It requires no carburetor, hot ball or spot, batteries or magneto, and will start cold, as was demonstrated.

Much interest was manifested in a new material for cutters, dies, gages, etc., termed Chrobaltic, an alloy containing chromium and cobalt, used as a substitute for tungsten and vanadium steel, and which can be cast into intricate shapes such as are required for milling and other cutters having multiple cutting edges. It is self-hardening, after heating to 1832 deg. F. The new alloy was exhibited by the Chrobaltic Tool Co., Chicago, which also displayed muffles of Pyrex, an alloy used also in making crucibles.

Much interest was shown in the exhibit of the Bullard Machine Tool Co., one of the principal features of which was an 8-in. Mult-Au-Matic, a production machine. The company also had in operation a 54-in. Maxi-Mill and a 36-in. vertical turret lathe.

Production Machines Draw Attention

The American Tool Works Co., among several machines, showed a triple-purpose radial drill with 6-ft. arm. This machine in a demonstration drilled a 4-in. hole in 0.50 carbon steel, the rate of penetration being 1.6 in. per min., running 65 ft. per min., the feed being .009 in. per revolution.

Conspicuous among the newer features of radial drills were air clamping devices for locking the arm to the column. It appeared that machines having a simplified drive, the motor being mounted on the arm, are growing in favor. On all these tools, the control is so centralized that the operator has no need to leave his station so far as the operation of the machine is concerned.

The Warner & Swasey Co., which has now become a familiar exhibitor at the railroad shows, displayed nothing new in the way of tools, though this year it used Steellite cutters in machining steel in demonstrating railroad work on a 3A turret lathe.

The Napier Saw Works, Inc., made an initial exhibit of a band saw machine equipped with a hydraulic feed of simple yet effective design.

Shown for the first time by the Beatty Machine & Mfg. Co. was a combination triple punch, shear and coping machine, designed for repair work in railroad shops. It is built in sizes to punch up to 2½-in. hole through 1½-in. plate, and to shear plate up to 11 x 1½-in., rounds up to 3¼-in. and angles up to 8 x 8 x ¾-in.

A track exhibit of interest was an electric freight locomotive, the mechanical parts of which were built by the Pennsylvania Railroad and the electrical parts by the Westinghouse Electric & Mfg. Co. It is for operation at 11,000 volts, single phase, from overhead trolley and will develop 9800 hp. Its constant running speed is 20.6 miles per hour, and it has a power factor of 100 per cent. Its total weight is 250 tons.

Mobile Machine Shop Shown

The American Car & Foundry Co. displayed in the open air a heavy artillery mobile repair shop, shown by courtesy of the Ordnance Department, U. S. Army. The full outfit consists of two identical sections of 24 vehicles, each served by 185 men. It was designed for repairs to guns, tractors and other ordnance equipment in the field. The equipment shown consisted of a number of trailers, heavy trucks on each of which were mounted one or more machine tools of standard makes. For each of the following there was a trailer: drill press and shaping machine, lathe, air compressor, electric generator, milling machine, power saw, and tool-room equipment. Each machine was electrically driven, current being carried to each trailer for lighting and power by cable. The machines, with benches containing storage room for small tools, comprised a machine shop having a wide range of usefulness.

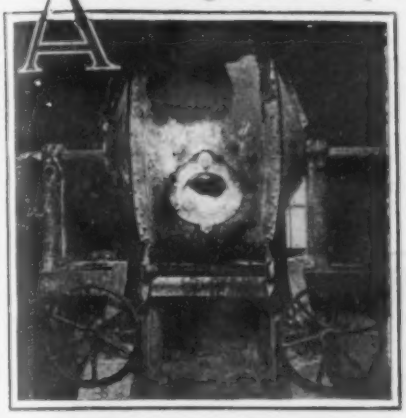
Among the machine-tool exhibitors were: Acme Machine Tool Co., Charles H. Besly & Co., Blevney Machine Co., Cincinnati Bickford Tool Co., Cincinnati Grinder Co., Cincinnati Milling Machine Co., Dale-Brewster Machinery Co., Davis Machine Tool Co., Gould & Eberhardt, Heald Machine Co., Landis Machine Co., LeBlond Machine Tool Co., Lodge & Shipley Machine Tool Co., Lucas Machine Tool Co., Newton Machine Tool Works, Inc., Niles-Bement-Pond Co., Oakley Machine Tool Co., Osterlein Machine Co., Sellers & Company, Inc., Swind Machine Tool Co., Western Machine Tool Works, and Wilmarth & Morman Co.

At the first meeting of the executive committee of the reorganized American Railroad Association, held June 19, R. H. Aishton, regional director, North Western Region, was elected president of the association. The first annual meeting of the reorganized association will be held on the third Wednesday in January, 1920, at Chicago.

A New Electric Rotating Brass Furnace*

The Booth Unit Can Be Operated by Power Obtained from Most Public Service Companies—Lining Has No Joints—Uniform Mixing a Feature

BY CARL H. BOOTH



ABOUT five years ago several electric furnaces were designed for the production of special chemical compounds. These furnaces were cylindrical in shape and arranged to rotate about a central axis through which the electrodes projected. At the time it was suggested that this type of furnace could be adapted to the melting of nonferrous metals, but there was no opportunity to carry on such work. An illustration of one of these furnaces is shown in Fig. 1.

In these earlier furnaces a door was provided in the cylindrical surface of the shell and lining, for charging and pouring, but considerable difficulty was experienced in maintaining the lining around this combination spout and door. Further, in pouring the furnace it was troublesome and inconvenient to be obliged to place the ladle between the supports beneath the furnace. Consequently, in designing the present Booth furnace, these difficulties have been overcome by placing the door in one end of the furnace, as shown, and having a tapping hole in the other end. In this way the cylindrical surface of the lining and shell is unbroken by any opening. This permits the continuous rotation of the furnace and consequently the absorption of heat by the charge from all parts of the lining, which means no local overheating and uniform wear.

Holding Capacities

As a general rule, the quantity of nonferrous metal melted at one time, or at one heat, is less than the quantities involved in the melting of steel and iron, and, therefore, smaller sizes of furnaces are desirable. To meet the requirements of the small foundry, as well as the large, and the smelters and refiners, Booth furnaces are built in the following sizes:

Rated holding capacity	Maximum holding capacity
250 lb.	350 lb.
500 lb.	750 lb.
1000 lb.	1500 lb.
2000 lb.	2500 lb.
3000 lb.	4000 lb.

There are many small plants where heats of 50 to 350 lb. are required, and the smallest furnace shown above answers the purpose with great economy, whereas larger furnaces to operate efficiently must produce more metal than is needed. Further, there is a great disadvantage in trying to pour a ton of brass into small castings and keep the metal hot. It takes one large company having a one-ton electric furnace 50 min. to pour a heat into castings, and it is experiencing great difficulty in doing so. In addition, the great variety of mixtures made by many small foundries requires a small, efficient unit, from which "short" heats can be taken, producing flexibility of operation. On the other hand, smelters and refiners frequently require furnaces of relatively large holding capacity, which will turn out a considerable amount of metal per day. Any one of the above furnaces will melt and bring to pouring temperature a charge of its rated holding capacity in an hour's time, when the furnace is hot.

Mechanical Details

The illustrations give an idea of the general design of the Booth electric furnace. The furnace rotates on rollers and is carried by two cylindrical tracks. The rollers are driven at the proper speed by a motor, so as to rotate the shell at the rate of 2 r.p.m. No gearing is required encircling the furnace. The current is carried to the electrodes by means of short pieces of flexible cable, which connect to the track, and the current is supplied to the track by means of shoes which press against them and form a sliding contact. The electrodes are regulated by means of the screws shown. On small furnaces they are entirely hand operated, but

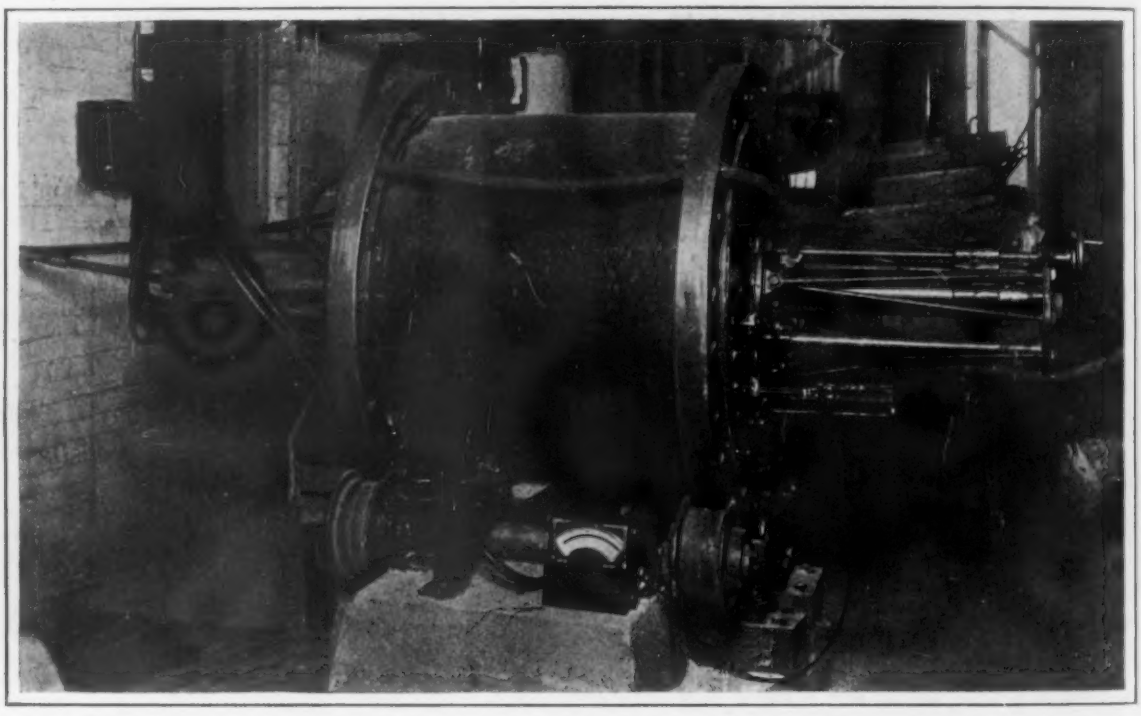
Pouring Brass from a Booth Electric Rotating Furnace. The operator is at the switchboard in the background

*Abstract of an address delivered before the eleventh semi-annual meeting of the American Institute of Chemical Engineers, Boston, June 18. The author is president Booth-Hall Co., Chicago.

on the larger furnaces automatic electrode control is used, thus doing away with the necessity of close watching on the part of the operator. In the small furnaces the door is in one end only, but in the larger furnaces both ends are provided with a door.

One illustration furnishes a rear view of a 250-lb. Booth electric brass furnace, in the foundry of Leitelt Brothers, Chicago. This shows the charging door open ready for charging. The latch which holds the door shut when the furnace is charged will be noted and also the electrode projecting through the door. A door of similar type with electrode projecting through it has been in use for a considerable period in the construction of the Booth-Hall steel melting furnace, built by the same company. The contract shoes are shown pressing against the track.

In another view the flexible cables from the track to the electrode holder are shown, as are also the water-cooling connections for cooling the electrodes. It is not necessary to open the door until after the heat is poured. The door is then opened for charging. The cylindrical drum type shell and the track driven by the rollers are visible, as are also the bronze shoes which carry the current to the track, and the flexible cable connected with the electrode holder and the water connections. The pouring tap is shown directly beneath the electrode holder frame.



Side View of Furnace. The operator regulates the flow of the current by means of the handwheel at the right

Another illustration reveals a side view of the furnace. The cable supplying the power to the furnace comes from conduits in the floor and connects with the bronze shoes. These are the only connections necessary to carry the electricity to and from the furnace. The operator regulates the flow of the current by means of a hand wheel. The furnace pouring is also shown in an illustration. The operator is at the right, controlling the furnace at the switchboard by means of push-button control.

The Lining of the Furnace

Probably the most important of all factors in reliable and efficient furnace operation is the lining. Especially is this true with the melting of nonferrous metals, where a lining with many joints will have a decided tendency to absorb metal. In order to overcome this difficulty the lining provided with the Booth furnace is made with as few joints as possible.

In lining the furnace the electrode supports at either end of the shell are removed by simply unbolting them from the end plates. These are made as a unit, and in taking them off they do not get out of adjustment or out of line, and therefore do not require any readjusting when put back in place. The shell can be lifted off the rollers by a suitable hoist or crane, just as if it were a barrel, and turned on end, so that the end plate of the furnace can be unbolted and removed from the shell.

One illustration shows to some extent how the lining is made. The door is made of one solid piece of brick with a hole in the center through which the electrode projects. The cylindrical part of the furnace is made of two cylindrical tiles, which fit together with a tongue and groove joint in the center, this joint being filled with heat-resisting cement. The ends of the furnace are each lined with four special brick joined together with cement and cemented to the tile. Thus the furnace is really a large crucible electrically heated, but with walls of considerable thickness, and a minimum number of joints. The lining does not require a brick mason to install it, but can be put in with common labor. The special brick lining is backed up with a layer of heat insulating material, so that when the furnace is at working temperature the temperature on the outside of the shell is so low that one's hand can be placed upon it. Compare this with the large amount of heat in the neighborhood of crucible or other fuel-fired furnaces, and it will become apparent why it is easier to get men to work around a furnace of this character. The time required for relining the furnace is 8 to 12 hr.

Furnace Operation

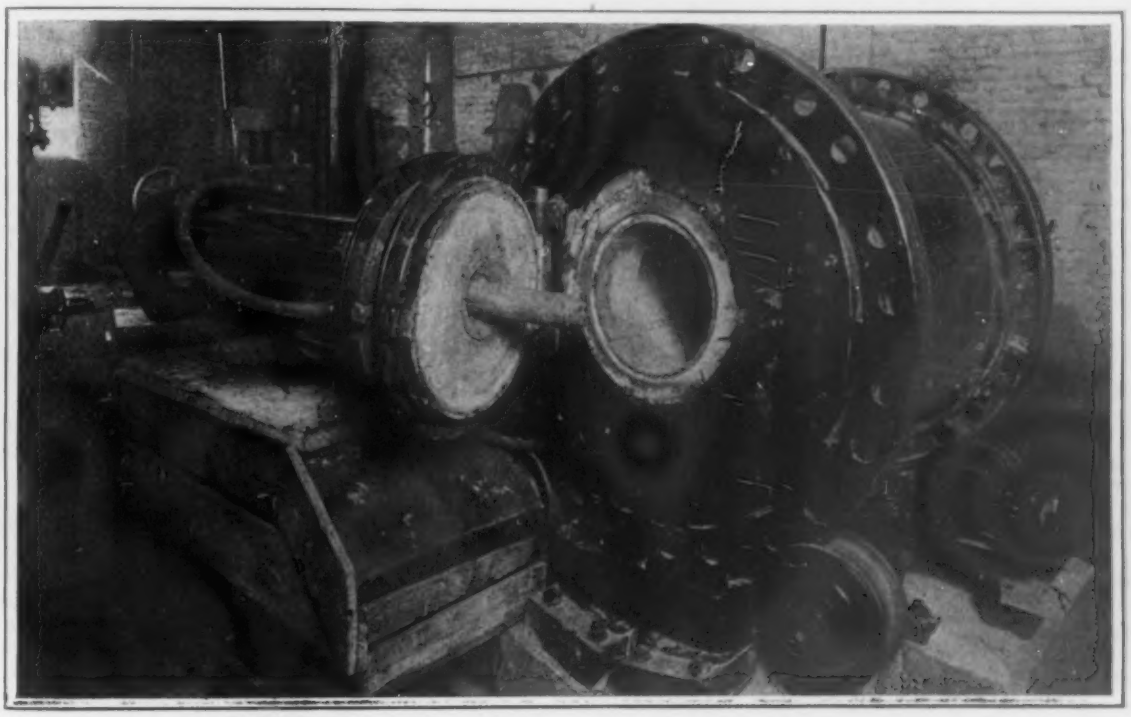
In starting the furnace the tap hole is plugged with molding sand, the charge placed in the furnace, the door closed and the power thrown on. The electrodes are then brought together by means of the moving mechanism shown in one of the photographs and the amount of current regulated by moving the electrodes closer together or further apart, as indicated by a motor on the switchboard.

If turnings, floor scrapings or grindings are used the rotation of the furnace is started at once and continues until the metal is ready to pour. No electrode has ever been broken through operating in this manner. If ingots or heavy scrap is used the furnace remains stationary until the charge is partly melted, and then rotation is started and continued until the metal is ready to pour. No difficulty has been experienced in regard to breaking electrodes when this method is followed.

As the furnace is sealed up quite tightly from the time the power is on until ready to pour, very good re-

sults have been obtained as to metal temperature by keeping the power practically constant for a definite length of time. After the operator has poured a few heats it is possible for him to determine the right temperature practically every time without opening the door and inspecting the metal in the furnace.

In pouring the pipe stands which carry the water connection simply lift out of the way without it being necessary to unbolt anything, enabling the men to go right up to the furnace with the ladle. When the furnace is ready to tap the operator stops the rotation until the tap hole is above the level of the holder and thus above the surface of the metal. The tap hole is then opened by means of a sharp pointed steel rod. No sledging or pounding is required, as the tap hole is simply plugged with molding sand, which can be very readily picked out with the rod. After the tap hole is opened the furnace is rotated down until the opening is below the surface of the metal, and the metal poured out into the ladle as illustrated. If it is desired to remove only a portion of the metal the furnace is again rotated back until the tap hole is above the level of the metal.



The Charging Door Opened and Ready for the Insertion of the Metal to be Melted

As there are no swinging cables connected with the electrode holders, it has been suggested that the furnace itself could be picked up from its rollers by means of a crane and the metal poured into ingots or castings. This has not been attempted as yet, but it seems feasible.

Metallic Charges Used

With the small furnace which is in the plant of the Leitelt Brothers, Chicago, about 130 heats have been poured, using a great variety of mixtures and pouring a considerable number of different grades of metal. The following have been used:

Yellow brass turnings and borings, concentrates from floor sweepings, grindings, foundry scrap, copper wire, sheet copper, red brass ingots, yellow brass ingots, copper ingots, pig tin, lead pipe, pig zinc, and german silver.

Power Consumption and Shrinkage

In melting down turnings, borings and grindings with a hot furnace, 30 to 40 min. is required per charge. With a small furnace power consumption has been as low as 240 kw.-hr. per ton; the average would be between that and 300 kw.-hr. per ton.

With yellow brass turnings and borings which are fairly clean, but on which no attempt has been made to remove any contaminating material, heats have been run with a total shrinkage of 1½ per cent. These borings, when charged, were in the same condition as received from the seller. Of course, the percentage of shrinkage will depend on the amount of oil, dirt, iron and other extraneous material present, but the actual metal loss has proved to be very low. Because of the active mixing action of the rotation, the heat is applied to the turnings and borings in such a uniform manner that there is no local overheating, and a quick melt with low metal loss is obtained.

In melting concentrates from floor sweepings, which contain a considerable amount of dirt and moisture, and which, when melted in crucibles, showed a shrinkage of 30 to 40 per cent, the furnace over quite a number of heats averaged 17½ per cent shrinkage.

In melting ingots and heavier brass scrap, a heat will average from 30 min. to an hour in length of time, depending upon the kind of metal poured and the size of the charges. A 300-lb. charge of copper ingots requires about an hour to melt and pour, and a 300-lb. charge of yellow brass about 40 min. The shrinkage with yellow brass ingots averages about 1 per cent, and on red brass and high copper bronze under 1 per cent. With the furnace hot the power consumption will run from 250 to 350 kw.-hr. per ton.

One heat was made with a charge running about 50 per cent zinc and 40 per cent copper, totalling 250 lb.; 249 lb. of metal were poured and the power consumption was 240 kw.-hr. per ton. This was in the latter part of the day, when the furnace was hot, and the metal charged was all clean metal. The ladle was weighed as it was brought to the furnace, and then weighed after the metal had been poured into the ladle. Great care was taken on the part of the operators not to overheat the metal. The heat following this was a charge of 225 lb. of red brass ingots, from which 224½ lb. of metal was poured.

It is particularly difficult to keep account of the metallic shrinkage in a small furnace of 250 lb. holding capacity, and consequently great care has been exercised. Arrangements were made for a scale near the furnace upon which the heated ladle was weighed when brought to the furnace and again weighed when filled with metal. Any drippings from the furnace were carefully collected and weighed and any slag coming out with the metal was skimmed from the pot before weighing, as even a small amount of 1 lb. would mean almost one-half of one per cent shrinkage. With a larger furnace it would be much easier to make shrink-

age tests without danger of as large a proportionate loss as with the smaller furnace.

Lining Wear and Electrode Consumption

Although to date about 130 heats have been run, the lining on the furnace illustrated shows no perceptible wear. It is sintered upon its surface and appears to be in as good condition as when originally installed. The material of which the lining is made is such that it does not shrink, spall or crack, although the furnace is run on an average of 8 hr. per day. It is believed that linings of this type will last from 600 to 1000 heats, and possibly longer, with proper care.

An important characteristic of the lining is the fact that it contains practically no joints. This serves to keep it clean and prevents any considerable amount of slag or metal sticking to it.

With furnaces of this type the graphite electrode is to be preferred, because of its greater conductivity, which permits the use of the smallest size of electrode practical for the current to be carried. On this furnace electrodes of 2½ in. diameter are used—machined and equipped with what is known as nipple joint. These are 30 in. in length. The electrodes enter the furnace through graphite sleeves, which are protected by a water-cooling copper casting which serves to prevent the electrodes from burning at this point. Even with the small 250-lb. furnace shown the electrode consumption is low. If the furnace is kept in operation fairly continuously during an 8-hr. day, the consumption will average about 3 lb. per ton.

The electrode supporting mechanism has been so designed that it not only permits of adjustment in case electrodes are slightly out of line, but at the same time serves to protect the electrodes from breakage, through the accidental falling of bars or other material against the end of the furnace.

The Power Factor

A great deal of difference of opinion still exists among operating engineers as to the proper power factor to be used in connection with electric furnace loads. With small furnaces of the type described it is believed that as low a power factor should be adopted as can safely be permitted with the conditions met with at the point of installation. This can be varied to suit different conditions by modifications in the design of the equipment. If a power factor as low as 70 per cent is permitted the result will be that the furnace operator need not stay at the electrode hand wheel control to any great extent, but may be employed in getting his charge ready for the next heat, making suitable records and other miscellaneous duties. If, however, a higher power factor is required the furnace can be readiiy operated, but will require more attention on the part of the operator unless automatic electrode regulators are provided.

In case a battery of small furnaces is installed and a sufficient advantage in power rate can be obtained by using a higher power factor than 70 per cent, it would probably be best to install automatic electrode regulators. There would also be compensation in reduced labor cost, due to the fact that one man could take care of a large number of furnaces under such conditions. On small furnaces of the size described one operator can conveniently handle three furnaces without the use of automatic electrode control. This would of course not include the miscellaneous labor for charging and making up the heats, but one extra man could easily do this.

With this 250-lb. furnace a ton of metal can be easily charged, melted and poured in 7½ to 8 hr. This same rate of speed is maintained for all sizes of the Booth electric brass furnace. With the larger sizes it will of course take a little longer time to charge and pour, but proper mechanical means can be provided for charging so as to reduce the time to a minimum. If the furnace is used entirely for melting turnings and borings and other small scrap the daily output will be slightly increased.

Freedom from Explosions Due to Gas Pressure

Where mixtures are used which might result in the formation of much gas pressure in the furnace, the charging door need not be luted up so as to permit of the escape of the gas pressure without blowing out the end of the furnace. This can be accomplished in a very simple manner by leaving the tap hole open for a short time in case it is desired to burn off the oil and dirt prior to the melting of the charge. In other words, with a charge of turnings and borings which are dirty and oily, the furnace can be turned around on its rollers so that the tap is located at the top position instead of at the bottom, and then be permitted to remain stationary with the tap hole open.

Cost of Operation and Upkeep

The complete rotation of the Booth electric furnace results in more even wear of the lining, a greater absorption of heat by the metal, and consequently improved power consumption. These factors help to bring down the cost of melting and upkeep charges. Since this type of furnace has been in operation only about a month, operating data regarding costs are not available.

The rotation of the furnace not only preserves the lining and secures a low power consumption, but at the same time serves to mix the metallic charge, making it more uniform without requiring much supplementary stirring. Except in the case of mixtures with high lead content, the rotation of the furnace will sufficiently mix the charge so that it is not necessary to stir it either in the furnace or in the ladle.

In the past the construction of electric furnaces has been along lines which require the use of special electrical appliances and equipment. The Booth electric furnace is a departure. It is practical to operate it by the ordinary 110-volt single-phase service which can be obtained from most public service companies.

Pig Iron and Spiegeleisen from Scrap Steel

Frank H. Crockard of Birmingham, Ala., has been granted a patent (U. S. 1,274,245) covering a method of making pig iron from scrap steel.

In certain territories in the United States it is impossible to make what is known as Bessemer pig iron on account of the high content of metalloids, such as phosphorus, carried in the ores from which the pig iron is made. The patentee's invention contemplates the use of all-steel scrap of a suitable character to produce a Bessemer grade of pig iron, without the addition of any ore to the charge. The blast furnace is charged entirely with steel scrap, with the requisite percentage of a flux, and with coke for the purpose of melting the scrap and furnishing the carbon for recarburizing the molten product in the furnace. The smelting is then carried on as usual. By this process a grade of pig iron is produced which cannot be obtained directly from the use of ores carrying phosphorus in excess of the Bessemer limits.

The iron so produced can be used for many purposes for which high phosphorus irons are not suitable, such as the manufacture of ingot molds for steel works and as recarburizing materials used in the manufacture of high carbon steels.

This same process, it is suggested, can also be used to advantage in producing spiegeleisen. By introducing into the charge of the furnace a small proportion of manganese ore with the scrap, flux and coke, a regular grade of spiegeleisen can be produced, which it is impossible now to do from ores carrying phosphorus in excess of the Bessemer limits.

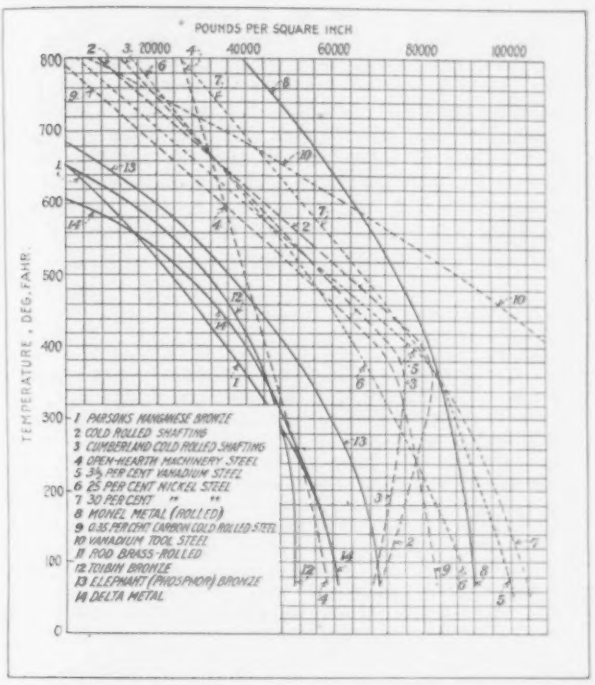
According to figures of the United States Geological Survey, the production of beehive coke is estimated at 269,000 net tons for the week ending June 7, an increase compared with 264,500 tons in the week ended May 31, but below the output of 660,000 tons in the week ended June 8, 1918. Production of beehive coke this year to date is estimated at 8,750,000 tons compared with 13,207,000 tons in the same period of last year.

MONEL METAL AND ITS USES

Origin, Chemical Composition, Characteristics and Commercial Applications

BY HUGH R. WILLIAMS*

Monel metal is distinctive and individual in characteristics, and though an alloy, is a natural product. It is no more a synthetic mixture than one of the basic metals would be if chemical research should establish the fact that iron, for instance, was composed of two or more chemical elements. The chemical composition



Influence of Temperature on Torsional Strength of Metal Rods

is nickel 67 per cent, copper 28 per cent and other elements 5 per cent, the latter chiefly iron from the original ore, and manganese, silicon and carbon added during the process of refining the metal matte.

The metal is a product of the peculiar nickel-copper sulphide ores of the Sudbury District, Ontario, Canada. The ores are converted into a matte by a special roasting process that, while practically eliminating the sulphur content, does not disturb the intimate combination of the chief metal ingredients, nickel and copper, effected through centuries of geological formation. The ore is basic igneous rock carrying sulphides of nickel and copper with pyrrhotite (magnetic pyrites) as constituents, the sulphides more or less segregated.

The metal was originally developed in 1905 and 1906 to compete in the German silver field, the ingredients for the synthetic alloys of German silver being derived in considerable quantities from the nickel and copper output of the Sudbury mines by electrolytic refining of the copper bearing ores. It was proposed to put the natural alloy in competition with these synthetic alloys and this may have been the basis upon which was built the quite popular misconception that monel metal is some kind of a synthetic alloy similar to brass, bronze, German silver or one of the numerous alloys developed for special purposes.

Physical Characteristics

The successful refining of the Sudbury ores without separating the main metal ingredients produced a metal with a tensile strength equalling or exceeding that of mild steel, tough yet ductile, non-corrodible in the commercial sense, and one that could be machined, forged, soldered or welded as well as cast, and that possessed other properties of commercial value. Its high nickel content made it virtually immune to oxidation. To the corroding action of most commercial solutions of acid, hot or cold, the metal showed unusual resistivity and for all practical purposes was unaffected by saline solutions, such as sea water and the majority of alkaline mixtures employed in industry. [Care needs to be exercised that conditions do not provide for electrolytic action.—Editor.] Instead of a metal suitable simply as a substitute for German silver, it proved to be a metal qualified by physical, chemical and electrical properties to compete with and in many instances displace the industrial metals, the steels, bronzes, composition metals, acid-resisting and anti-friction metals, as well as the special synthetic alloys containing nickel in major proportions.

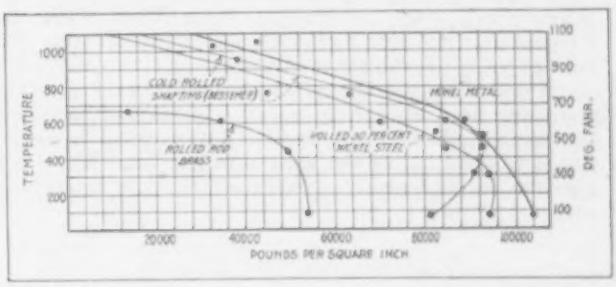
The physical properties and the records of strength tests listed in the accompanying tables emphasize some of the distinctive characteristics of the metal, but there are other peculiarities. In the matter of acid-testing capacity, for instance, a piece of monel metal was immersed in a solution of cold 40-deg. sulphuric acid for 56 days and at the end of that time the test piece showed no loss of weight. The alternate action of sea water and air, which causes rapid pitting of bronzes, copper or steel, leaves monel metal unaffected.

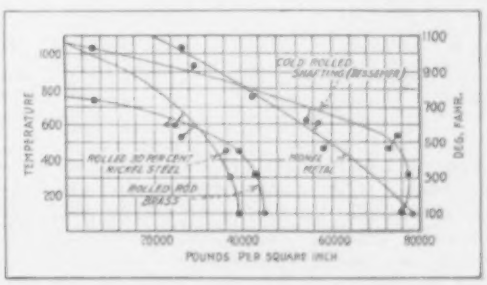
Commercial Applications

The first commercial application was in 1908 when the propellers of the U. S. S. Dakota were cast of monel metal. The resistance of the wheels to shock and their rigidity, due to the high modulus of elasticity of the metal, reduces the possibility of a broken propeller and the high polish the wheel blades take and retain adds to the speed of the vessels and minimizes power consumption.

The second commercial use was in the form of sheets for roofing the Pennsylvania Railroad Terminal, New York, in 1909. This structure is protected by 265,000 sq. ft. of monel metal sheeting used for roofing, flashing, gutters and cornices, and is proving satisfactory. The sheets do not require painting and, owing to low heat conductivity, they largely insulate the building from climatic variations in temperature.

Since these two original installations, the metal has successfully invaded many commercial fields of industrial activity. It has been used for water wheels, golf





Influence of Temperature on Tensile Strength of Metal Rods

club heads, cooking utensils, fly screens, novelties, in the power house and about the mines, in the steel mill and the rapidly growing dye industry. In the form of castings, rods, sheets or wire, it has proved its adaptability and quite frequently, its superiority.

In the modern steam power house, monel metal has been a factor in making possible the effective use of high-pressure superheated steam. Its expansion and contraction under varying degrees of temperature are very nearly the same as steel, a peculiarity possessed by no other of the common industrial metals, making it particularly adaptable for valve seats, discs and other fittings for high pressure cast steel valves, or for parts

*Technical service department International Nickel Co., 43 Exchange Place, New York.

forming an integral part of cast steel mechanisms or devices subjected to the influence of the elevated temperatures of high pressure steam carrying superheat. The fittings of monel metal expand and contract with the steel, thus avoiding the warping and deformation, and under repeated temperature changes retains its ductility, strength and toughness.

In rolled form, the ultimate tensile strength of monel metal at temperatures up to 1000 deg. Fahr. is greater than that of the other metals ordinarily furnished in the form of rods. It is stronger than 30 per cent nickel steel at all temperatures and at high as well as normal temperatures, is stronger than cold rolled shafting (Bessemer). Cold rolled steel shafting has the distinction of attaining its maximum tensile strength at a temperature in the neighborhood of 500 deg. Fahr., but even at such temperature the strength of monel metal rods is somewhat the greater. At its elastic limit, monel metal possesses greater tensile strength than the other rod metals at such critical point, with the sole exception of Bessemer cold rolled shafting, while at temperatures up to about 800 deg. Fahr. and higher, it is stronger than the other metals.

Under torsion, monel metal is stronger than Vanadium tool steel at temperatures in excess of about 600 deg. Fahr., and at all temperatures, it is stronger under torsion than rods of nickel steel, bronze, cold rolled shafting, machinery steel, etc.

Of the three classes of metal suitable for steam turbine blading, brasses, nickel steels and monel metal, the latter meets the practical demands the more effectively. It is also well adapted for use as pump liners and pump rods, particularly if liquids of a corroding nature are handled. The liners do not pit due to the acid or alkaline character of the liquids and after a short period of service assume a glass-like finish. Pump rods take on a finish that tends to economy in power consumption and in the use of packing.

Monel metal castings, rods, sheets or wire and equipment fabricated in whole or in part of the metal have found a varied use where chemicals and other corroding agents are handled, for instance in laundries, chemical works, dye houses, refrigerating plants, in the handling of mine waters and for pickling equipment in steel mills. For the last named service, a number of steel rolling mills, such as the Illinois Steel Co., West Penn Steel Co. and the American Sheet & Tin Plate Co. are using the metal.

STEEL PRICES IN JAPAN

Reductions Forced by Those Put in Effect in the United States

WASHINGTON, June 24—Copies of the *Japan Chronicle*, Kobe, dated May 20, have been received here and contain some interesting comment on the Japanese steel situation. "A little while ago," says that paper "the Japanese steel merchants succeeded in inducing the Government to suspend sales of iron and steel until they could dispose of their high-priced stocks purchased in America. Apparently they have succeeded in making the consumer pay, for we have already heard of the same gentlemen raising complaints regarding the high prices charged by the Yawata State Steel Works in Kyushu for its iron and steel as compared with the market price prevailing in America.

"Some of the merchants who can afford to wait have, therefore, been hesitating to buy. In view of such circumstances, the Yawata works has decided to lower prices to the level of the American market. Below we give the reduced prices of some of the more important items:

	Yen	Dollars
Plate (ordinary thickness)	250	123
Plate (thick)	325	162
No. 28 B.W.G.	300	147
Steel plate	373	183
Bars (ordinary)	185	91
Bars, 7/16 in.	212	104
Bars from ⅜ to 5/16 in.	217	106
Bars, ¼ in.	220	108
Angle iron	200	98
Channels	240	118

"The steel merchants can only be congratulated on the adriotness with which they continue to play it both ways. Meanwhile the taxpayer makes good the losses incurred by running the State Steel Works for the benefit of commercial speculators.

"With reference to the statement made in regarding the decision of the Yawata State Steel Works to reduce the price of iron and steel according to the American market price, it is interesting to note that this decision has reduced the market price by 30 sen to 40 sen (15 to 20c.) in the case of round bar iron.

"At the beginning of April, this iron stood at 5.50 yen to 5.60 yen ($2.20 to $2.25). With the turn of the month, it increased to 6.50 yen ($3.24) and now stands at 7 yen ($3.43). As the Yawata quotations are still higher than the market price by 20 to 25 per cent, the market is expected to recover gradually."

The following details are published concerning the tin plate situation:

It is stated in Japanese papers that the demand for tinned sheets has greatly increased of late. In pre-war times it was sold at 25 sen (12c.) per piece, and there was not much demand for it. The outbreak of the war, however, gave an impetus to the demand, which became so acute that stocks began to run short. The situation was further complicated by the stoppage of imports from Britain and America. At one time it was quoted at 1.30 yen (64c.) to 1.40 yen (68c.) per piece, and consequently the petroleum consumers had to sell oil in bulk only, so as to avoid paying the ridiculously high prices—or rather so as to be able to retail their oil at all. Since the proclamation of the armistice the tension has become less, owing to the American lifting of the embargo on the export of tins. The market took a downward tendency from that time, until at last the price has come down to 45 sen to 46 sen (22c. to 23c.), in March last.

The market has now become active again owing to the large demand from Manchuria, where the cans are used for bean oil, and also from Hokkaido for the use of fish oils. To the former, it is said, 400,000 pieces have recently been exported. Under such circumstances the price has run up by about 30 sen to 76 sen (37c.). A further increase is expected owing to the demand exceeding the supply. Tin plate is one of the articles which the Japanese have long looked forward to making for themselves, and from time to time success is reported—and no more heard of. The great increase in the tinning of food has created a strong demand, but while American and European manufacturers are still using paper and pasteboard wherever they can, so as to economize tin plate, the chief interest in the local market lies in such upward rushes of price, due to the local demand, as that recorded above.

British Output of Steel Products

LONDON, ENGLAND, June 16.—The output of semi-finished and finished steel in Great Britain for 1918 as compared with 1917 was as follows, according to data issued by the Iron, Steel and Allied Trades Federation, in gross tons:

	1917	1918
Blooms, billets, slabs	2,073,178	1,992,822
Sheet and tin plate bars	1,089,749	1,301,904
Total semi-finished products	3,162,927	3,294,726
Rails, new	340,088	357,940
Tram rails	2,646	4,400
Sleepers and fishplates	28,445	35,623
Plates not under ¼ in. thick	1,326,584	1,345,493
Plates and sheets under ⅛ in. thick	753,775	839,577
Black plates	142,403	212,698
Shell steel*	1,746,000	996,000
Girders, joists, beams	222,440	253,113
General merchant steel	523,437	514,139
Hoops and strips	198,944	202,946
Wire rods	204,121	243,770
Tires and axles	50,846	54,047
Steel forgings	207,848	261,031
Steel castings	202,520	306,851
Unenumerated products	837,824†	1,593,640
Total finished products	6,787,921	7,221,268

*Based on returns made to the Ministry of Munitions.
†Subject to rectification.

Co-operation in Labor Matters Imperative

Danger Which May Result from Obstruction by Employers—Common Counsel Necessary—Weaknesses of Unions of the Older Type—Home Rule Necessary

BY WALTER GORDON MERRITT

TO secure this whole-hearted co-operation, there is gaining strength a new point of view where the employer stresses the collective as well as individual self-interest and responsibility of the workers, for labor cost. What a worker or body of workers produce for the benefit of society must be the measure of their return, rather than the law of supply and demand. Labor cost and not wage rates should be the standard. The wages allotted to any workman individually or to any department collectively should be made to depend on the volume, character and cost of their production, and the workmen should be vested with the power to increase wages in accordance with this rule. Individual workmen, presented this opportunity and responsibility, usually show themselves efficient in reducing the labor cost. Hitherto this has been tried only individually, and now it is proposed to do it collectively as well, so that each workman will also take an interest in what his fellow workers are doing and will thus learn a further lesson in co-operation. The piece work or bonus plan for each individual does not bring this result because it is purely individual and furnishes no incentive to improve team work or the collective operations of the department by helping a fellow workman or ousting a slacker. It stimulates individualism rather than co-operation.

The shortcomings of profit-sharing are in the opposite direction. To be sure, it aims to promote co-operation throughout the entire concern by giving every man an interest in the final result, but its unfortunate features lie in the fact that the amount of the benefits is indeterminate until the end of the year and is dependent upon many factors which are beyond the ken and observation of the beneficiaries. Ultimate profits are dependent on many foreign elements, like management, salesmanship and production in other departments, which the workmen do not comprehend, and the results are largely within the control of the employer. Furthermore, distribution is long delayed and "hope deferred maketh the heart sick." Between these two extremes of individual piece work and profit-sharing lies the individual department as a productive unit. Within this unit rewards can be based on the collective results and the collective results can be partially left to the self-government of the group. Of course, this rule cannot be arbitrary and conditions will arise in many factories calling for inter-departmental arrangements and arrangements sufficiently comprehensive to cover the entire factory, but the advantages of the small unit and direct self-interest, where the relation of cause and effect is clearly discernible to the workers, should never be lost sight of in the development of industrial democracy.

Promoting Factory Loyalty

In this article, the second in a series which Mr. Merritt is writing for THE IRON AGE *on labor problems, the importance of collective responsibility is emphasized, and some of the short-comings of both employers and employees are discussed. Mr. Merritt believes that it is not well for the rank and file of workers to obtain all their instructions from militant unions, or for employers to draw their inspiration from employers' associations only. He shows how factory loyalty can be promoted by organizations within the factory rather than by having men outside the factory dictate to the workers. He points out the futility of hoping to obtain enthusiastic co-operation through state control or national associations. His description of the undemocratic methods of some labor unions is very much to the point.*

Collective Responsibility

The promise of such arrangements is very large. A few factories have demonstrated the utility of such reorganization of industry and the encouraging results. The National Industrial Conference Board, a federation of employers' associations which speaks comprehensively for American industries, reports "a very strong tendency is apparent toward introduction of intra-shop methods of collective agreements * * * and these plans are generally reported as working out well." The trail has been blazed, if not well beaten, and the country through which it leads invites further excursions. When arrangements based on collective responsibility and collective results are introduced in a department, the attitude of the workers changes. Their interest is no longer limited to their own work. The circle of their observation enlarges, their vision broadens, and the underlying, all-important principle of co-operation is quickened. Employees become vigilant to spur the laggard and caution the careless; discipline becomes more stringent than ever before because the workers are more severe than the employer with the delinquents and because correction and punishment are accepted with better grace. The old cry of capital against labor cannot befog the issue of inefficiency or insubordination when labor sanctions the discipline of labor. In some departments the workers bring about a reduction of the force because they find a smaller number can do the same volume of work. In delicate manufacturing, where damage is easily done to goods in process, it will be proven that there is no known remedy for avoiding loss which will be equally effective with co-operation and self-government. You cannot standardize or commandeer carefulness. Generally speaking, the committees elected by the men from their own number to carry out these desirable ends are intelligent and capable. Can one imagine the average labor union

or labor leader placing emphasis on such matters? Their energies are spent in the work of industrial armament and fighting and they have woefully neglected the work of co-operation and production. Their main contribution to efficiency and individual initiative is discouragement. It is, therefore, not strange that employers and many workers welcome the works committee as an improvement over the class unions, which, with their anti-social attitude and economic heresies, have unwittingly plowed and sown the industrial field for just such a crop of new organizations.

Plan Should Be Introduced in Normal Way

Works organizations should not ordinarily be established in a strange and sudden manner in a factory which is unaccustomed to them, but should be the normal outgrowth of current opportunities and problems as they arise. If a small department committee is started in one department, after conference with the men there employed, it is not unlikely that the men in other departments will become interested and other department committees can be installed on their initiative, which is preferable. The question of a general committee can await further developments. The management, from the foremen up, should be carefully schooled in the new idea before the step is taken. In the end it will succeed only if the management is broad and sincere in its purposes and is successful in overcoming the spirit of distrust and antagonism which exists among many employees. While the stimulus of suggestion must be afforded by the employer where the plan is first tried and his guidance will be essential at many points, he should aim to have the workers assume as much initiative and leadership, both as to the form and operation of the plan, as they are willing to assume. The plan must not be something which the employer is doing for his employees, but something which he invites his employees to do for themselves. It must be something created from within to such an extent that the employees will regard it as their own and give homage to it accordingly. The spirit of good will and co-operation which can be created through such an institution, established in such a spirit, seems almost incredible.

Common Counsel Desirable

For an employer entertaining the old prejudice and brought up in the individualistic school, the adoption of such a highly experimental scheme involves considerable courage, for no one can assert that in this country such plans have been in existence a sufficiently long time in a sufficient number of companies to definitively demonstrate their enduring reliability. Any advocate of them is obliged to leave the field of empiricism and to rely upon general principles in dealing with human nature. But where there is no panacea, the adoption of a plan, even though experimental, may be imperative as the lesser of two evils. If employers obstruct or even fail to encourage co-operation, self expression and a normal development of joint control in labor matters, they are inviting something far more disturbing as the outgrowth of class hostility. If the employees are not educated and counseled with on the inside, they will seek all of their education and counsel from the outside, and it may prove a lopsided education. It is unwholesome for the rank and file of the workers to secure all of their instruction from militant unions and little or none from the employers; it is unwholesome for employers to secure all their instruction from employers' associations. Unless the two interests meet together in common counsel, they will want for the mental nutrition which comes from the valuable social process of integrating varied ideas. What a change will come about when tolerance dictates a mutually receptive hearing by both sides in industry! A synthesis of the ideas of management and employees and a factory loyalty which is "the consciousness of oneness" would seem to be best achieved through a form of factory government which provides for common counsel and which gives the workers a voice in matters of their employment.

Some Unions and Employers Opposed

Some employers oppose this kind of collective action among workers on the ground that it will foster the old type of militant unions, but, ironically enough, union leaders are opposing it on the ground that it obstructs unionism. The leader of the Bridgeport strikers has been quoted as bitterly opposed to the type of shop committee which has been generally instituted in some 60 factories in that city under the supervision of the National War Labor Board as a result of the difficulties which suspended the output of munitions in the summer of 1918. In other places, union leaders have carried on active propaganda to oppose the introduction of collective co-operation at the instance of employers, and have prevented their members from endorsing or participating in it. In one factory which comes to mind, every department except one is actively working on a shop committee basis, and that one department, which is the only union department in the factory, refuses to act. The union men declare they will not sit in conference with non-union men. They prefer disfranchisement to such a course. It is strange indeed that conservative employers and extreme unionists should be united in regarding this kind of shop committee as a common enemy. Considering the divergent roads by which they arrive at the same conclusion, it is obvious that some one is wrong. Both cannot be right.

Factory Loyalty Strengthened

The truth of the matter, so far as disclosed by experience which, to be sure, is very limited, indicates that intra-factory organization of employees produces greater loyalty and solidarity between the management and the employees and thereby makes the men less susceptible to the appeal of militancy. Education and organization within the factory seem to be an antidote to misleading propaganda and misdirected organization from without. The employer who claims that this new movement will multiply the evils of unionism forgets his own accusations. He has complained that there is no real democracy in the old type of union; that the bosses and misleaders are in the saddle because the stable, conservative type of workmen upon whom business interests can place reliance, absent themselves from union meetings and remain at home with their families. The new type of organization meets this difficulty. It creates machinery where all the rank and file participate more actively by holding meetings in the factory during working hours and on the company's time. The War Labor Board discovered the necessity for this procedure through hard experience. In the case involving the Pittsfield plant of the General Electric Co., the board installed collective bargaining and required that all elections be held at some neighboring public building. But it did not work. In spite of the temporary excitement, the attendance was slim. The board therefore changed its rulings so that all voting in this and other plants could take place within the factories. This experience tends to

demonstrate that true industrial democracy requires that the factory and not the union meeting hall or any other outside place should be the place where organization matters should be deliberated, wherever practicable, if a representative vote is to be secured and the quiet, responsible workman with a family is to participate. Just what improvement will be brought about by the intervention of such a class of workmen who heretofore have largely remained inarticulate is of course problematical, but there are those who look in this direction with great hope. All these arguments would seem to appeal to the employer, but whether they constitute grounds for opposition or approval on the part of any union must depend upon the character of that union. The radical militant union will scent danger here. The conservative, business-like union will recognize the fairness of the plan. Such works organizations do not interfere with the union which is willing to cooperate, but confront the anti-social union with a possible rival which will supersede it just in so far as the old union is autocratic, mismanaged and inefficient and just in so far as it depends upon force rather than service for its growth.

No Real Conflict with Good Unions

There seems to be no sound reason why the creation or operation of the factory organization should conflict with the conservative union which seeks sound working arrangements with the employer. It should not be utilized to discriminate against union men or legitimate union organizations. It will succeed only in the event that it serves the workers well and inspires allegiance. It will conflict with the old unions only in so far as the workers wish it to, and only in so far as the principles of unionism conflict with the sound principles of the shop committee movement. It is entirely conceivable that in some industries, where unionism is willing to respect the principles of the shop committee, that the two might work in genuine harmony. "The shop committee system," says a recent American writer, "may exist in open shops or in closed shops without effecting any basic change in the relation of the management to organized labor." But so far as the majority of workers are concerned, that idea is probably more theoretical than real and will continue to be so until union methods are altered. Industrial engineers tell how difficult it is successfully to install and operate such machinery for industrial representation in union shops at the present time, since the union is still dominated by a militant rather than a co-operating attitude.

Mutual Confidence Must Displace Hostility

The factory organization will fail of the best results, just as unionism has failed, unless the employer has confidence in his workers and will faithfully and sincerely adhere to the letter and spirit of the co-operative idea. If the works committee is regarded purely as a medium for the making of treaties or armistices, or the carrying out of negotiations between hostile factions, it will accomplish but little good. "Works committees," reads a Whitley report, "would fail in their main purpose if they existed only to smooth over grievances." Any employer may well hesitate to encourage and organize a power within his factory if his relations to it are to be those of mutual antagonism. If suspicion and distrust and the balance of power are to remain the controlling forces in his determination of labor conditions, an insuperable instinct will direct him to adhere to the individual bargain as against collective bargaining and to maintain the old time disciplinary methods. The factory organization will prove a success only in the event that mutual confidence and goodwill supplant antagonism and distrust; only in the event that the employer has faith in the capacity of his employees successfully to administer some degree of self-government in connection with matters directly affecting their interests. The representatives of the two interests must learn that the true social attitude does not compel a choice beween individual self-assertion or compromise, but that most questions are best settled by an integration of varying ideas which thereafter becomes the composite thought of all. The grain of wisdom which lies behind most people's ideas should be woven into the group conclusion.

Where to Draw the Line

There will be critical times in some factories where the workers will attempt to assert a right to participate in problems of general management rather than confining themselves to the problems of their employment. When the camel's nose enters, no one can tell what will happen. It is believed, however, that a wise administration will find little difficulty in confining the workers to matters of their direct interest under existing conditions, if profit-sharing is not adopted. No serious difficulty of this kind seems to have arisen as yet.

Limited Industrial Democracy

Since actual experience is so limited, it is natural to inquire whether this plan of factory organization, considered in the light of fundamental theory, has the inherent strength to survive. Does our experience with political democracy justify the hope that industrial democracy of this character will succeed? Some of us used to feel that while political democracy in a powerful nation is able to survive in spite of its blunders, industrial democracy, which enters the field of economic competition with its exacting requirements, is more dubious. Our attitude was dogmatic, for it failed to see the opportunity for self rule in the limited field which directly involved the employment of the workers. How absurd to let the workers have a predominating voice in the government of a state composed in part of doctors, lawyers, ministers and bankers and to deny them a voice in matters particularly within the limits of their own knowledge, understanding and self-interest! Within the field of their own particular service, the understanding of the workers may be made clear and their action intelligent. A sharp line must be drawn between questions which are managerial in their character and those which relate directly to the activities and surroundings of the workers, and it is believed as to those problems, where the group involved in self-government is limited and its self-interest clear, that democracy is most promising. Among people of limited capacity, education and intelligence, self-government is likely to succeed in proportion to the keenness of their interest, and that depends upon the palpability of the benefits they derive and their ability to see the direction and certain results of their action. That is why the town meeting affords one of the leading examples of successful government and is one of the best, if not necessary, forms of preparation and instruction for participation in larger affairs. That is why the Zemstvos have succeeded in illiterate Russia. To state the negative: the further people are separated from the center of government and the more remote and inappreciable the consequences of their action at the polls, the more doubtful is the result.

Historically, have not the most successful forms of self-government been built from the ground up? Applying this same idea to shop government, there seems to be good reason to believe that democratic government in the individual shop should naturally be the beginning of any form of industrial democracy rather than attempts on the part of national unions to organize the factories from without and impose upon them, through a more or less bureaucratic agency, the conditions which the outsiders believe to be for their best interests. The workers have not had this normal method offered to them in the past and have therefore been obliged to organize class warfare in order to secure consideration of their needs. Will the employers offer them the normal method of progress in the future and thereby demonstrate that the anti-social methods are no longer required?

Enthusiastic co-operation cannot be secured either through state control or national associations, but only through voluntary agencies created and operated by those who have a direct self interest and daily observe and live with the problems and opportunities which arise in the course of routine events. Workmen then feel that production is partially their problem and that they will suffer according as it may be handled effectively or ineffectively. They inevitably feel this responsibility as soon as they have the power to act in connection with it, but not before. Control by outside labor leaders who do not stress or encourage such co-operation cannot bring this result.

Stirring Up Discontent

One of the tendencies of the older type of labor organizations is to stir up discontent among the men and hostility toward the employer as a necessary means to an end. Factory unity is not obtainable through such agencies. They are avowedly militant bodies, formed for the purpose of offense and defense, and their first step in winning converts is to increase the sense of a common peril. According to their philosophy the workers must be made dissatisfied and rebellious; they must come to feel that industrial peace is a dangerous opiate, to be taken sparingly, for the temporary relief of pain. That is the line of reasoning which lies behind much of the union campaign at the present time, and it is stated not with a view to disputing the modicum of truth behind it, but in order that it may be recognized as an underlying fact. It can even be conceded that the militancy of unionism has been necessary in the past in order to bring business interests to the present attitude of receptivity, but the time has now arrived to consider whether the organizations of class antagonism are not nearing the end of their usefulness. They inevitably conflict with factory co-operation and synthesized production for the benefit of society.

Democratic Principles Surrendered

The militant organization necessarily surrenders the true principles of democracy. The desire to stimulate antagonism against the employer and organize economic resistance—which, by the way, has been cunningly and dangerously used to stimulate antagonism to the state—leads inevitably to the intrusion of autocratic and militarist methods. Democracy, initiative, referendum, recall, freedom of speech, liberty, home rule, self-determination, the golden catchwords of political democracy, have often met with a sad fate in the economic circles of many unions. Yet men are far more capable of utilizing the tools of pure democracy within the limited field of their direct self interest than in the broader and more complex field of political control. For years the American Federation of Labor has urged the referendum, initiative and recall in American political life, while at the same time opposing its adoption in connection with the government of its own organization.

Undemocratic Union Government

At the convention of the American Federation of Labor held in 1912, the executive committee reported that 34 national unions elected their officers by initiative and referendum, 75 elected them by the convention system, 23 favored the election of the Federation officers by initiative and referendum, and 52 opposed such methods. The same convention adopted a report of its executive committee providing that while it was in entire accord with the principle of initiative and referendum as applied to general legislation and the election of political officials, it did "not believe that it would be advisable to apply this method to the election of officers of the American Federation of Labor." The only reason given for this conclusion, if it can be regarded as a reason, was that "in the political field and on questions of legislations, there is public and common information as fully available to one citizen as to any other through the public forum and the press." The absurdity of this conclusion was well presented in an opposing argument by the secretary of the United Mine Workers, who pointed out that the report upheld the ability of the masses of the people to pass upon amendments of the federal and state constitutions, while at the same time denying their ability to perform the less important duty of voting directly for their union officers. Another delegate declared that the convention would create dissatisfaction if it continued "to rule from above and give the masses of the workers no voice at all in the administration of their labor organization." The arguments as a whole pointed out the difficulty of securing a fair election and the inability of the workers individually to select ther own officers. They failed to recognize the fundamental principle that capacity for democracy is better shown in a limited field of self-interest, like in industrial affairs, rather than in the broader field of political matters which involves complicated interests of many kinds beyond the worker's vision. It is a sad commentary indeed that the activity of many labor leaders and the organic government of many unions deny the workers' capacity for self-government even in the field of their specialization.

Principle of Self Determination Violated

Likewise, the principle of self-determination suffers disregard. Passing over the fact that few unionists respect the right of the worker to remain outside of the union if he so desire, we find that in place of self-determination the Federation of Labor has deprived some unions of the very right to exist. The rights of liberty and freedom of speech are also at times forgotten. He is blind, indeed, who does not recognize that one of the sins of unionism is the suppression of discussion at the local meetings and on the jobs which sometimes takes the form of depriving the conservative element of a hearing. This suppression and the fact that union meetings are usually held at night, lead the conservative man to stay away and leave the organization to the direction of the professional. It is perhaps natural that men who have not been accustomed to power, when placed in the powerful position of a union official should abuse their authority, but it is this very fact, coupled with evidence of such abuse, which urges the necessity for more democratic

methods if the rights of workers, employers and society are to be protected and democratic co-operation is to be secured from the great mass of the workers in the individual shops.

Home Rule Disregarded

Absentee control and failure to respect the principles of home rule have been particularly unfortunate. It is no unusual occasion to find that the employers and workers immediately involved desire to, and would, settle a controversy if it were not for the obstructions presented, sometimes by the national by-laws of the union and sometimes by the intervention of absentee union officials. So we see it is a very real difficulty which has led the employer to oppose union recognition on the ground that he desired to deal only with the parties in interest. In the long run he will not oppose collective co-operation and adjustment when he is assured that it means home rule. The National War Labor Board also comprehended the difficulty of outside interference. It affirmed the right of the employees "to bargain collectively through chosen representatives," but declared that "in establishments where union and non-union men and women now work together and the employer meets only with employees or representatives engaged in said establishments, the continuance of such conditions shall not be deemed a grievance." The speedy and effective adjustment of disputes which certainly should be one of the objectives of our industrial society, requires that the greatest possible freedom should be vested in the parties in interest to accomplish this result. If employers' associations or national unions are to restrict and hamper their membership unduly in such matters, industrial peace will be pushed one step further away.

Grievances Arbitrarily Treated

The workers too are finding the old type of unionism at fault because it creates a gulf between them and those who are supposed to represent them. They object to inflexible rules which hamper the speedy and easy adjustment of disputes between the immediate parties in interest. They object to the arbitrary way in which their own grievances are treated. They recognize a superior but impersonal authority over them toward which they instinctively feel antagonism. That is the secret of the revolt of the workers in Great Britain against their national leaders and the rise of the so-called shop steward movement. "There seems to be a marked disposition among the rank and file of the workers," says an official report, "to criticize the present union system because it denies to workmen in the shop an opportunity promptly to rectify grievances irrespective of their particular craft union . . . At the present moment there is rather a widespread feeling among the workingmen that the officials of the labor unions have become detached from the atmosphere of the shop and are not in proper sympathy with the workmen." The workers resent restraints on their rights of discussion and action relative to matters of their own interest in the factories, and that resentment runs alike against dictatorship by the employer or a national union. "The feeling in the minds of the workers," runs one of the Whitley reports, "that their conditions of work and destinies are being determined by a distant authority over which they have no influence, requires to be taken into consideration not only by the government but by the unions themselves." To meet this difficulty the simple operation of works committees contrasts most favorably with the complex, cumbersome machinery of the unions.

Herbert Lagardelle, a leading French syndicalist, writing his views on unionism, says:

"Unions are applying to their own members the autocratic rules laid down by capitalists. They have organized a workers' government as harsh as the bourgeois government, a workers' bureaucracy as heavy footed as the bourgeois bureaucracy, a central office which tells the workers what they can do or cannot do, a thing which destroys in the unions and in their members all spirit of independence and initiative and frequently leads its victims to wish for a return of capitalist autocracy."

Control by a Central Labor Office

As a result of this feeling of distrust between the individual workers and their national officers, it has frequently happened in Great Britain and occasionally in this country that the union officers have not been able to control their members and so-called "unconstitutional strikes" have taken place contrary to union orders. It is another instance where the introduction of absentee management, whether of employers or unions, promotes estrangement between the rulers and the ruled which very closely parallels the present antagonism toward our political government. In industry it is believed that this is largely avoidable through making each company itself a kind of industrial republic. Any form of workers' organization which conflicts with the rights of home rule, self-determination and freedom of discussion should either be reformed or give way to the new form of organization which at least respects the possibilities of self-government among the workers themselves. In a day when everybody asserts the need for direct human contact as between man and man, and the danger of impersonal control, which does not recognize a more direct responsibility, it is high time that labor organizations were obliged to abandon the idea that labor can be controlled and directed in masses from a central labor office.

[THE IRON AGE has received a number of letters expressing keen interest in Mr. Merritt's articles, which are to be concluded next week.]

Important Topics

In the next and final article, Mr. Merrit will discuss the following topics:

Inter-corporate labor adjustments are not class problems.

A community plan for co-operation.

Sympathetic strikes are futile.

Each factory is the economic unit of self-interest.

Employers must hold allegiance of employees.

Substitute factory solidarity for class solidarity.

English conditions based on class division.

Whitley reports defer to class organizations.

Opportunity for American employers.

Labor turnover and factory loyalty.

Government co-operation with works organizations.

National benefits.

INTERNATIONAL RESEARCH

Work of American and British Societies on Steel —Flakes in Gun Steel

The work of the engineering division of the National Research Council of the United States was discussed before the May meeting of the Iron and Steel Institute in London by Prof. Henry M. Howe, who is an honorary vice-president of the institute.

Professor Howe read his paper in full and said that the American National Research Council was an institution not for executing but for stimulating scientific and technical research, and to this end it aimed to become an affiliation of the scientific and research interests of the United States. The council is composed of 13 divisions, each devoting itself to a special field in industrial research.

He confined himself chiefly to the engineering division, because it aimed to cover all branches of metallurgy. Research was stimulated chiefly through the creation of active committees, of which the division in question had now about 20, each charged with a research believed to be of engineering importance. The members of each committee were all intended to be active in executing its work, in connection with their own regular work in the laboratory or other research, educational or industrial institutions, in which they were engaged. Thus there were brought to bear on each problem the men best fitted for studying it, and the resources of a number, sometimes a very large number, of the best equipped laboratories in the United States.

Fatigue of Metals

The first problem taken up by the division was the fatigue of metals, under the chairmanship of Prof. Herbert F. Moore, University of Illinois, with six other members representing the United States Bureau of Standards, two institutions of learning and four industrial research departments. The thorough study of fatigues, as influenced by the microstructure, the composition and condition of the metal, and the ranges of frequency of repetition, required such very extensive and prolonged tests that the world seemed to have balked at it. It needed an attack on a national, if not, indeed, on an international scale.

The Research Council had not the funds to finance 20 such active investigation committees for each of the 13 divisions. In this and other cases they hoped to get the money needed from the presumptive beneficiaries of the research. Other committees are dealing with alloy steels; with the improvement of metal by treatment at a blue heat; and with the heat treatment of carbon steel.

Snow Flakes in Gun Steel

Referring to the lack of knowledge in the matter of alloy steels, Professor Howe stated that an American gun maker was much troubled with flakes in nickel steel. By halving the nickel content, the flakes were greatly reduced, without preventing the product from passing the inspection tests; by omitting all nickel, the flakes disappeared almost totally and the product continued to pass the tests. Here, therefore, a costly addition of 4 per cent of nickel was a positive damage, so far as concerned the tests.

The council expected to be also useful in impoving the general environment of research, for instance, by propaganda aimed to cause American institutions of learning to favor research by their own staff far more than at present, and impressing on the various industries the great benefits which the more progressive establishments are now gaining by their own resources. The objection had been raised in some quarters that all the work of the council might repress individual activity. Professor Howe thought, on the contrary, that the experience in the past in regard to committees wisely directed showed that these were very far from repressing such activity. The council tends to the benefit of the community at large, and this after all is the end to be borne in mind, not so much the benefit of the individual.

The Discussion

Dr. Rosenhain, who opened the discussion, said the organization of research was very much in arrears. The revitalization of research was very important, but he questioned whether, if an organization for research tended to repress individuality it would not be a loss, on the ground that it was not the individual but the community that counted. Individual research work was to be encouraged. A large quantity of committee work had been carried out during the war, and that committee work did not repress individuality; on the contrary, it had a stimulating effect. Human rivalry came in and had its effect.

American Organization in Advance

Professor Turner thought that the organization of research in the United States had already proceeded further than in Great Britain, but the Department of Research in the United Kingdom had formed a number of committees on lines which were not far different from those outlined by Professor Howe. It was a wise course followed in America by which the central organization was not intended to conduct research, but to arrange for others to do so, to stimulate them and to provide the means.

Dr. Cottrell said he had been associated on the Government side with Professor Howe in the organization outlined in the paper. The organization formed a useful connecting link between the permanent Government and the academic bodies throughout the country; there was always need for great co-ordination between the two. In France, the same problems had to be faced. He referred to the inter-Allied conference on chemistry which had been held in Paris about one month ago, very largely owing to the efforts of Professor Louis and P. Kestner, the president of the French Chemical Society, a conference at which the academic interest shown was very marked.

The International Phase

Professor Louis strongly emphasized the international side of the question, adding that work hitherto had been carried out too much in watertight compartments, as was evidenced to some extent by Professor Howe's paper. There was strong evidence that resources should be combined. The bodies such as those which had been formed in the United States and in other countries would render real service in picking out the men who could carry out real research work. It was right that such men, in whatever country they were born should be recognized not only as national, but also as international assets. International co-operation could also get through a large amount of spade work to clear the ground. Thus the committees referred to by Professor Howe would obtain from the American steel works a number of ingots, and these would be analyzed and examined; a British committee under Dr. Stead was doing the same, and the very first thing to be done on both sides was to exchange specimens. The same with France, Italy and other countries. A national standard for steel was aimed at, but a step further should be taken and an international standard arrived at; international co-operation should be the object in view.

Professor Howe, in reply, said it was not the first class but the second class man who required stimulating. The organization referred to in the paper would remove from the first class man a great deal of detail work; the man of first ability, for example, would not be required to carry on tensile tests, but would direct all the work. He was very glad Dr. Cottrell and Professor Louis had emphasized the international side of the schemes. When the schemes referred to were internationalized they would have a very great value. He hoped that means would be taken for the exchange of steel specimens with friends on the European side of the Atlantic.

The Properties of High Speed Steel*

Its Metallography and Heat-Treatment—Crucible and Electric Process in its Production—Effect of Uranium—Cast High Speed Steel

BY G. J. HORVITZ

COMPARATIVELY speaking, the use of high speed steel is of recent origin when we consider that in 1740 Houseman first gave to the crafts a carbon steel suitable for cutting tools. This remained the only cutting medium up to 1870, when Mushet introduced his self-hardening steel containing tungsten and later chromium. Aside from exhibiting remarkable physical characteristics, this steel showed a cutting efficiency of about 14 to 1 over the carbon steel, since it could be run at a far greater speed and with a deeper cut.

From time to time the amounts of the alloying elements were increased or other elements added to increase cutting efficiency, thus giving us with but slight exception a high speed steel closely approximating in composition that in use today. In 1900 Taylor and White brought out their process of heat treatment of high speed steel by means of which such beneficial properties were conferred upon it that the cutting efficiency was again greatly increased. They found that by heating this steel to a temperature which with a carbon steel would be ruinous, namely, near its melting point, it would possess red hardness.

Composition in General Use

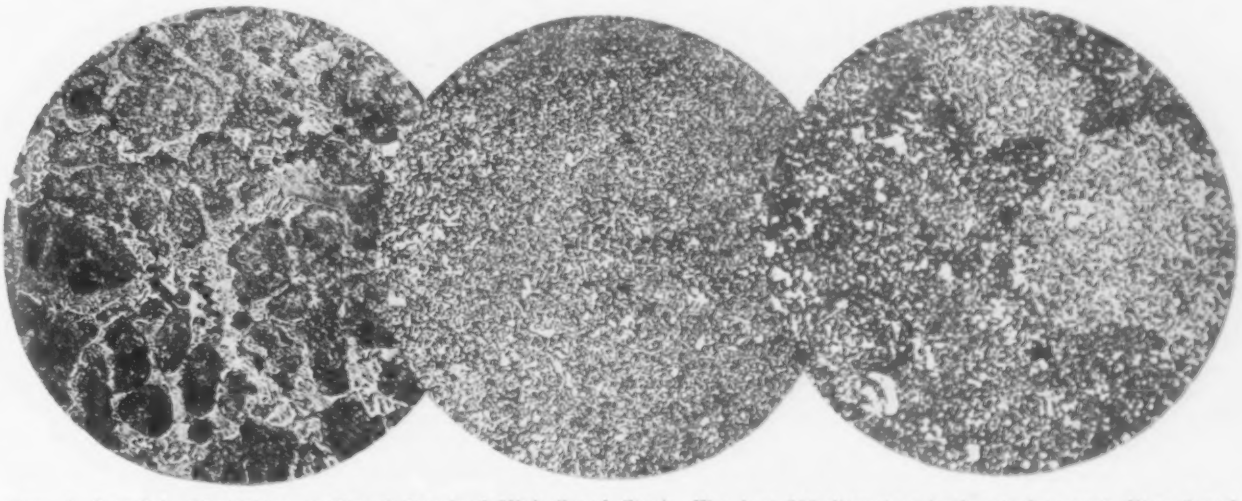
The composition of high speed steel in general use today averages 15 to 20 per cent Tungsten, 4 to 6 per cent chromium, 0.50—1.50 per cent vanadium and 0.60—0.90 per cent carbon. The following is a typical analysis:

	Per cent		Per cent
Carbon	0.67	Tungsten	16.50 to 19.00
Manganese	0.27	Chromium	4.39 to 6.00
Silicon	0.23	Vanadium	0.82

However, though the above elements are common to practically all high speed steel, different manufacturers have added certain others, such as uranium, titanium and molybdenum, etc., giving in most cases real improvement in quality and cutting power.

Crucible and Electric Processes

High speed steel, as in the case of carbon tool and the better grade of alloy steels, is made both by the crucible process and by means of the electric furnace. Though the former is one of the oldest of the steel making methods, it is carried on much in its original form. The crucibles are made of a mixture of Ceylon graphite and German fire clay, which combination has been found to give best results. The charges weigh from 100 to 125 lb. each. After the steel becomes liquid, sufficient time is allowed for the mass to become homogeneous and the various chemical changes to take place. At this point the quality of the steel to a large extent depends upon the ability and judgment of the melter. If he should pull the heat before complete deoxidation, the steel would contain excessive oxide and sulphide inclusions which would render it useless and vice versa; too long a time at heat would result in an increase in carbon and silicon due to absorption from the pot.

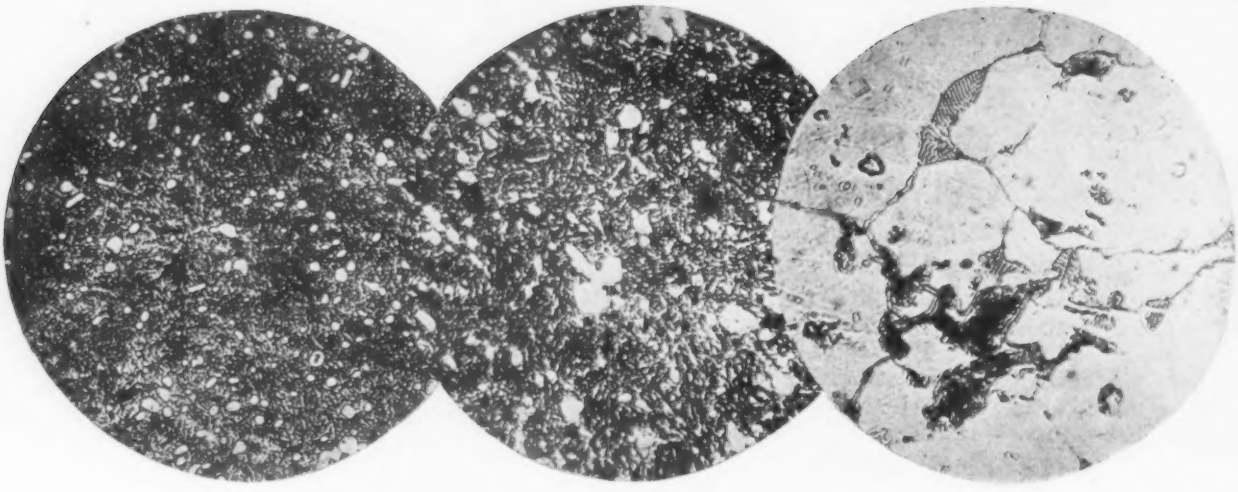


Figs. 1, 2 and 3—Photomicrographs of Standard High Speed Steel. Fig. 1 at 200 diameters is the steel as cast. Figs. 2 and 3, at 500 diameters, is the same steel well annealed and poorly annealed respectively. The etching agent was nitric acid plus ortho-nitro-phenol

At the proper time the crucibles are removed from the furnace and their contents are either poured directly into molds or into preheated ladles. Though the latter acts as a mixer and results in a more uniform product, quick action must be taken to prevent freezing, since the working limits in temperature with this class of alloy are necessarily narrow. The ingots ranging from 4 in. to 16 in. square are allowed to cool slowly to prevent strains in the solid metal.

With the electric furnace process high speed steel can be produced at much less cost. Greater care is necessary in this method in order to produce a uniform steel, however. Ferrochrome must

*From a paper presented at the June meeting of the New York chapter of the American Steel Treaters' Society on June 20. The author is metallurgist with the New York Testing Laboratories, New York.



Figs. 4, 5 and 6—Photomicrographs of Standard High Speed Steel in the Hardened Condition. Fig. 4 (left) has been hardened at 2350 deg. Fahr., Fig. 5 at 2150 deg. Fahr. and Fig. 6 at 2400 deg. Fahr. All are at 500 diameters and etched in nitric acid and ortho-nitro-phenol

always be added after the steel is liquid and the black slag changed to brown, otherwise it will pass into the slag, forming calcium chromate. The steel must be poured hot but not too hot as blow holes will result. The microstructure of the metal at this point is very coarse and the carbides, though uniformly distributed, are large and angular in appearance. Fig. 1 shows the honey-comb structure found in these steels as cast.

The metal in this condition is entirely unsuited for use as a tool and must now be subjected to a number of operations before the desired structure so necessary to good cutting efficiency is obtained. In the first of these the ingots are slowly reheated to from 2100 to 2200 deg. Fahr., then taken to the steam hammers or hydraulic presses and worked down approximately to size, after which the bars are put through the rolls and finished.

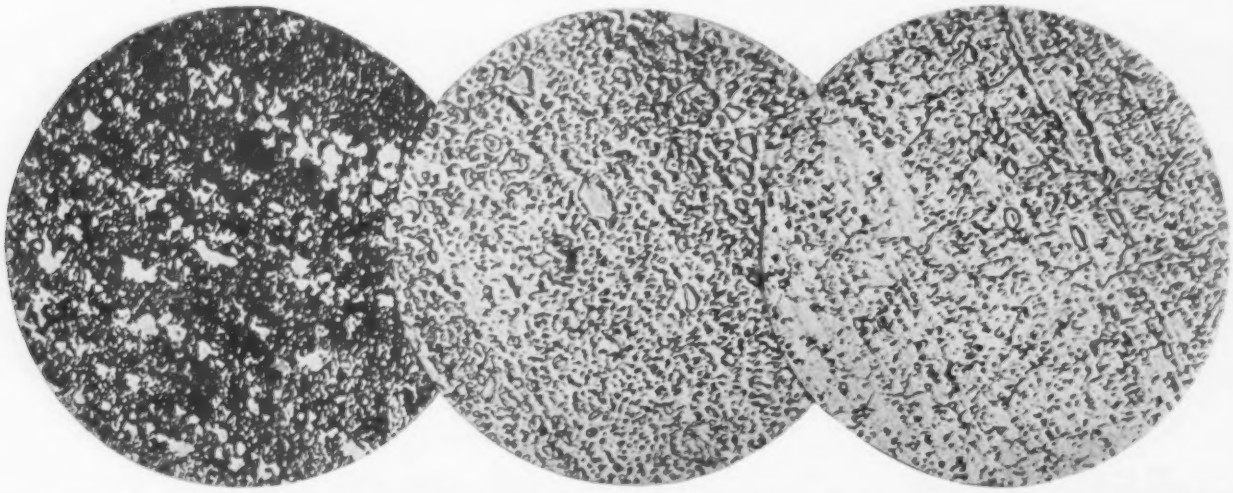
While running through these operations the stock is reheated when necessary to maintain correct forging temperature. While this results largely in the breaking down of the cellular ingot structure, there still remain slight segregations and irregularities due to forging and rolling which can only be eliminated by prolonged annealing. The primary object, however, is to place the steel in the best possible condition for machining. This is done by packing the finished bars in pipes and according to various practices, annealing for long intervals at temperatures ranging from 1350 to 1500 deg. Fahr. Fig. 2 shows a well annealed steel in which the carbides are uniformly distributed in a sorbitic matrix. Fig. 3 is a poorly annealed steel with the carbides badly segregated. Each are magnified to 500 diameters.

Hardening the Steel

One of the most important stages in the making of a high speed tool is the hardening. Here one is confronted with many practices and superstitions, some possessing merit but more often otherwise. In the small shop this operation is with a few exceptions left to the blacksmith who places the tool on the forge and brings the nose to what he judges is the right heat which will vary from light yellow to white, then quenching in oil. As there is no means of temperature regulation there is no possibility of obtaining uniform results.

With good commercial practice two general methods are in use—that of hardening from a gas or oil-fired muffle, or electric muffle, and from a molten salt bath, each of which have advantages depending upon the use to which the tool is put.

For heavy duty tools and cutters the muffle type is desirable, in which a uniform mellow heat may be maintained. For twist drills and delicate tools where large production and freedom from warpage are factors, the molten salt bath is more suitable. In this latter type barium chloride is in general use together with a small amount of ferrocyanide to prevent decarbonization.



Figs. 7, 8 and 9—Photomicrographs of Uranium High Speed Steel in the Quenched Condition. Fig. 7 (left) has been oil quenched from 1850 deg. Fahr., Fig. 8 from 2200 deg. Fahr. and Fig. 9 from 2350 deg. Fahr. All are at 500 diameters and etched in nitric acid and ortho-nitro-phenol

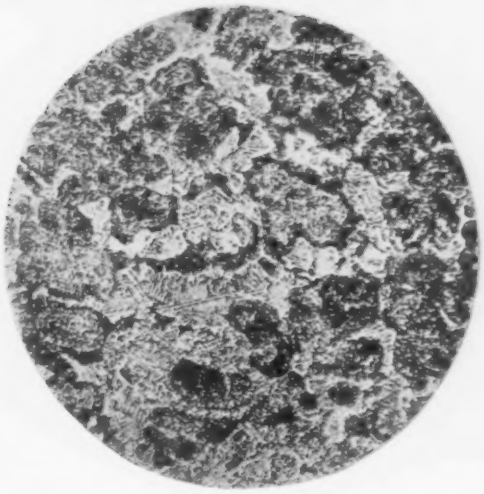


Fig. 10—Photomicrograph of a Cast High Speed Steel Tool, Annealed at 1500 deg. Fahr. and Air Cooled. The structure is coarse cellular. Magnification is 500 diameters, and the etching was done with nitric acid and ortho-nitro-phenol

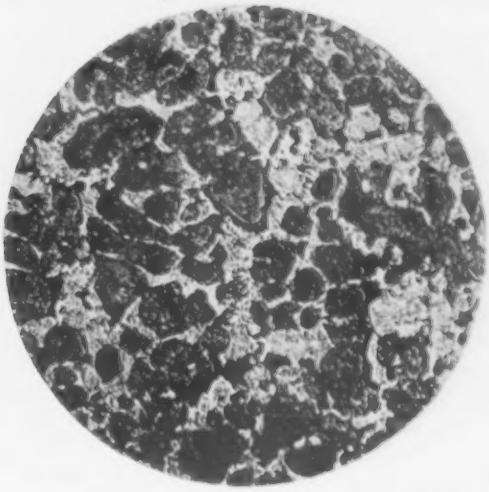


Fig. 11—Photomicrograph of a Cast High Speed Tool Steel, Annealed at 1350 deg. Fahr. and Furnace Cooled. The structure is considerably finer than that of Fig. 10, but is still cellular. Magnification and etching same as Fig. 10.

However, the procedure is the same in either method. The steel is preheated in an open furnace to temperatures between 1500 and 1700 deg. Fahr., then transferred to the hardening furnace where it is held for a definite time interval and between temperature ranges of 2200 to 2350 deg. Fahr. This is followed by quenching in oil or molten lead to retain in solid solution those hardening constituents, namely, carbides of iron, tungsten and chromium, dissolved at the high temperatures. Pyrometric apparatus capable of measuring these high temperatures must be used with good judgment. And whether radiation or optical pyrometers or noble metal thermocouples are used, the heat must be uniform throughout the furnace to give a correct indication of temperature.

Preheating the steel before placing in the hardening furnace eliminates danger of cracking, for were the cold tools to be put into the hardening furnace at the necessary temperature, such enormous strain would be set up between the comparatively cold core and the hot exterior that failure would certainly result. Time at and temperature of hardening heat are important factors depending upon the composition of the steel and the class of work the tool is to perform. These must be determined experimentally, though it is usually found that the higher the tungsten content the higher the hardening temperature should be to effect solution of the carbides as complete as possible. Should the time at heat be too prolonged, abnormal grain growth would lessen the efficiency.

On the other hand too short a period at heat would result in large carbide areas and consequently reduced efficiency. Experimental heats run on 3/8 in. square stock containing 16.70 per cent tungsten showed that by holding for 20 sec. at 2250 deg. Fahr., the carbides appeared to coalesce into globules several times the size of those in the original annealed bar. Holding for 40 sec. gave a fair structure which, though the carbides were still numerous but considerably smaller in size, resulted in a tool suitable for better work. By holding 60 sec., the finest structure and greatest efficiency were imparted to the steel while the carbides were few in number and very small. This tool would possess the high tortional strength required in drill rod.

The benefits of a secondary heat treatment as worked out by Taylor and White are well known. By reheating the hardened tool to 1100 to 1125 deg. Fahr. and air cooling, not alone a harder

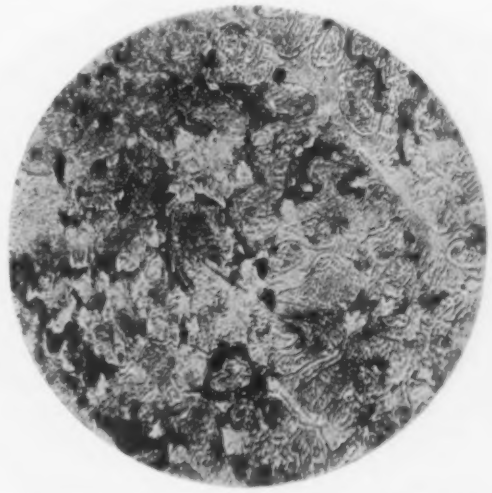


Fig. 12.—Photomicrograph of a Cast High Speed Steel Tool Annealed at 1800 deg. Fahr. and Furnace Cooled. The structure is sorbitic and contains double carbides; the cellular structure has been almost completely broken up. Magnification and etching same as Fig. 10.

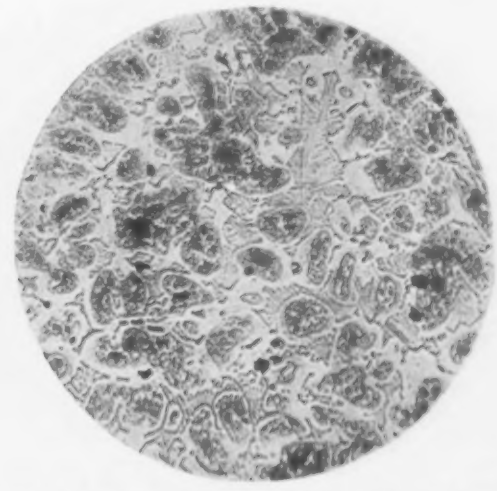


Fig. 13.—Photomicrograph of a Cast High Speed Steel Tool, Annealed at 1350 deg. Fahr. and Furnace Cooled, then Quenched in Oil from 2300 deg. Fahr. The structure is martinsitic (dark) and austenitic (white), with unabsorbed double carbide eutectic. Magnification and etching same as Fig 10

tool is obtained, but there is a gain in toughness as well. It has been experimentally found that the Brinell hardness has been actually increased from 700 to 740 deg. by this treatment. This has no noticeable effect on the microscopic structure, however.

A correctly hardened high speed tool is shown in Fig. 4. Unabsorbed double carbide globules are still present but they are very small. The matrix is a mixture of martensite and austenite, fine grained. This steel had a fine, silky fracture. In Fig. 5 it will be noticed that the carbides are large and the structure very coarsely martensitic, giving a sugary fracture. This tool had been hardened at 2150 deg. Fahr. A typical burnt structure is shown in Fig. 6. Partial liquation has taken place as indicated by the eutectiform carbides. Specimen was oil quenched from 2400 deg. Fahr.

Uranium Steel

A series of quenching heats were run on a uranium high speed steel containing 20 per cent tungsten. Fig. 7 shows a sample oil quenched from 1850 deg. Fahr. The carbides are badly segregated in a troosto-sorbitic matrix. The Brinell number was 550. Fig. 8, which represents a sample quenched from 2200 deg. Fahr. in oil, has a hardenite matrix, but the carbides are very large. The Brinell number was 650. Fig. 9, hardened at 2350 deg. Fahr., has the most desirable structure, namely, a faint polygonal austenitic grain structure in which are imbedded a few small carbide globules. The Brinell hardness was 700.

Theory of Hardening

As to the mechanism of hardening, I would refer you to the exhaustive investigations undertaken by Prof. J. O. Arnold and Reed, Edwards and Kikkawa, and Taylor and White. However, a brief summary of the action of the principal elements is outlined below. The effect of tungsten in high speed steels may be attributed to the following factors:

As a strong obstructing agent to the transition of austenite to pearlite.

As a fixing agent for martensite, thus conferring the property of red hardness.

Additional hardness imparted by the solution of iron tungstide and double carbides.

When a steel containing 0.65 per cent carbon and over 6 or 7 per cent tungsten is given a moderately rapid cooling, such as air quenching from a high temperature the change to pearlite is prevented. Depending on the temperature to which the steel is heated and upon the rate of cooling from that temperature, the steel may be austenitic, martensitic or troostitic in character. That this temperature must be high in order to produce self-hardening is shown by the fact that a very rapid air quenching from temperatures up to 1925 deg. Fahr. had practically no hardening effect on a steel containing 19.28 per cent tungsten with 0.63 per cent carbon. But by increasing the temperature to 2460 deg. and air quenching, a Brinell hardness of 500 was obtained. Even under these conditions the steel was much softer than a similar specimen containing 6 per cent chromium which had been slowly cooled in air.

The action of tungsten, in the absence of chromium, is to raise the temperature at which tempering or annealing begins, while in the presence of chromium, it increases the secondary hardness which is brought about by the low heat treatment, namely, tempering at 1125 to 1150 deg. Fahr. (Taylor & White). Chromium increases the solubility of the tungsten carbides to such an extent that with 6 per cent of the former element 19 per cent of tungsten can be held in solution at 2460 deg. Fahr.

A natural conclusion is that a high speed steel containing smaller percentages of tungsten would require a smaller chromium content to obtain complete solution of the tungsten carbide and the resultant desirable high speed properties.

Carbon should be kept within the limits of 0.50 to .80 per cent. Below this limit good cutting efficiency is not easily obtained, and above, the steel becomes extremely sensitive to heat treatment. High speed steel running above 1 per cent carbon cannot be hardened to the high degree possible with steel within the above ranges.

Cast Tools of High Speed Steel

Of late much attention has been attracted by the process of casting high speed steel directly into cutters, etc., and depending on heat treatment alone to give proper grain refinement. It is claimed that by certain methods a casting can be obtained having a fine grain and good strength, resulting not alone in a saving in machining, but also in scrap metal which is a considerable item.

A few of the results obtained by the writer in an examination of a cast high speed cutter are noted below. Analysis of the steel showed:

	Per cent		Per cent
Carbon	0.93	Vanadium	1.50
Chromium	5.07	Tungsten	21.02

The Brinell hardness obtained on specimens as received and heat treated was as follows:

Specimen number	Annealed at	Hardened at	Brinell
1	As received		332
2	1500 deg.; air cooled		332
3	1800 deg.; air cooled		600
4	1800 deg.; furnace cooled		336
5	1350 deg.; furnace cooled		321
6	1800 deg.; furnace cooled	2300 deg.; quenched in oil	600
7	1350 deg.; furnace cooled	2300 deg.; quenched in oil	600

Photomicrographs of this cast grade of tool steel are reproduced in Figs. 10, 11, 12 and 13. Microscopic evidence seems to point to the fact that heat treatment alone will not refine the structure of this improved cast steel to the extent obtained in the ordinary high speed which has been both hot worked and heat treated. Traces of the original cellular structure persist throughout.

Competitive cutting tests of cast cutters against the hammered or forged steel cutters have shown the cast steel to be almost as efficient as the latter with present methods of heat treatment.

Physical Properties of High Speed Steel

In closing, a few remarks in regards to the physical properties of this class of steel will no doubt be of interest. With 15.55 per cent Tungsten and 3.15 per cent chromium an ultimate strength of 250,000 lb. per sq. in. and an elastic limit of 220,000 lb. per sq. in. are obtained by quenching in oil from 1950 deg. Fahr. This gives a Brinell of 525 and scleroscope hardness of 65. Upon drawing, only a slight decrease is shown in these values up to 1200 deg. Fahr. where there is an abrupt drop. In the normal or annealed condition this steel runs 125,000 lb. per sq. in. tensile strength and 72,500 lb. per sq. in. in elastic limit, 11.5 per cent elongation and Brinell hardness of 217. A high speed tool properly hardened will have an ultimate strength of 275,000 lb. per sq. in. and a Brinell hardness of 700.

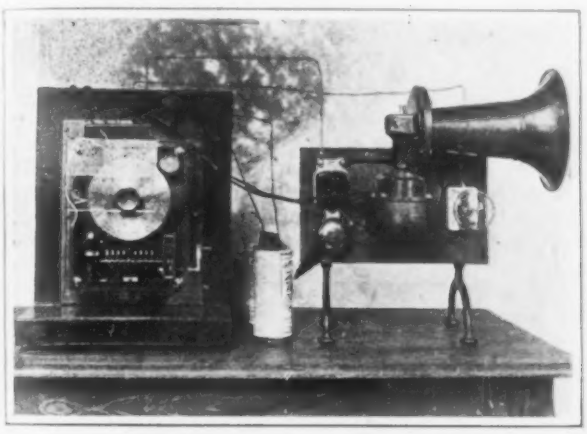
AUDIBLE ELECTRIC SIGNALS

Adaptability of Electric Horns for Signals and Plant Communication

In a paper presented before the Rochester, N. Y., section of the American Institute of Electrical Engineers, April 25, 1919, and before the Erie, Pa., section on May 13, V. Karapetoff, professor of electrical engineering, Cornell University, said:

No industrial plant of any magnitude can be considered fully efficient unless means are provided for promptly locating any important employee, no matter where he may be within the plant. On the other hand, a superintendent, foreman, millwright, or repairman, is ordinarily useful only insofar as he can freely move about the shop without the fear that someone of importance may need him. For these reasons audible electric signals have been introduced into many industrial plants.

Such a signal device is usually similar in construction to the familiar electric "horn" used on automobiles. It consists of a diaphragm with an anvil at its center. A toothed wheel driven by a small electric motor strikes the anvil many times a second, and causes it to vibrate vigorously. These vibrations produce the well-known



Automatic Device Which Can Be Adjusted to Cause Code Signals to Be Sounded by Electric Horns at Far Points and in Noisy Places Around a Plant. The apparatus shown is for demonstration purposes, and shows an electric horn also.

warning tone, which carries over a considerable distance. The device is provided with a projector or horn, the shape of which depends on whether it is desired to scatter the sound, to intensify it in horizontal direction, or to deflect it downward. Such signals are now made much more powerful than automobile horns, and are wound for 110 or 220 volts, direct or alternating current, so that they can be connected to a lighting or power circuit, and do not require a separate low-voltage battery.

With signal horns scattered throughout a plant it becomes easy to locate any person to whom a code number has been assigned. For example, when the manager wishes to speak to one of the assistant superintendents, who may be anywhere in the plant, he simply tells the telephone operator to sound this particular man's call. As soon as this assistant superintendent hears his call he goes to the nearest telephone and reports, whereupon the operator connects him with the manager.

It would be inconvenient for the telephone operator to sound various calls by hand; therefore a special code-calling automatic instrument has been developed. The operator merely sets the desired person's code number on a dial and pulls a lever; a contact-making mechanism is thereby set in motion, which closes the electric circuit and operates the code signals throughout the plant the required number of times (usually three times) and then stops automatically.

In some cases two separate circuits are run from the code calling mechanism, one circuit for ordinary calls, the other for loud fire-alarm gongs, or for some other special purpose. If two allied plants are operated side by side with a separate staff in each, the same code combinations can be assigned in both plants, but the horns in one or the other plant will sound according to which of the two circuits is closed.

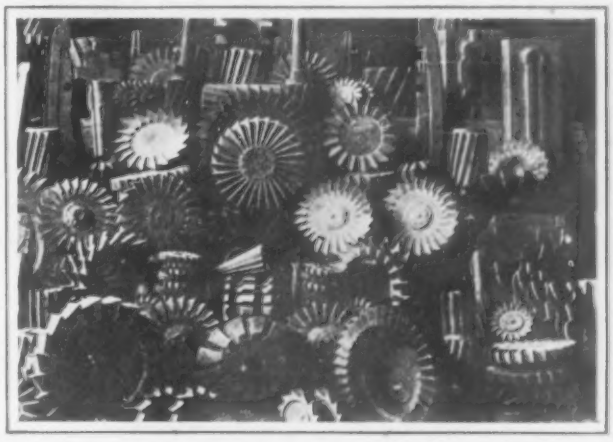
A further application of loud electric horns is for extensions to telephone bells. The ordinary telephone ringer is not loud enough in many shops when the foreman is away from his desk. In this case a relay may be connected in parallel with, or in place of the telephone ringer, and when it is actuated it closes a secondary circuit which causes an electric horn to sound. This call should be a single blast to distinguish it from code calls.

Audible electric signal systems are also used in various plants as warning signals on cranes and hoists, also to call a shifting locomotive, to indicate the beginning or the end of a certain operation, and for other local purposes.

New Alloy for Milling Cutters

A new high-speed steel known as chrobaltic alloy which can be cast into intricate shapes, is used as a substitute for tungsten and vanadium steel by the Chrobaltic Tool Co., Railway Exchange, Chicago, in the manufacture of milling cutters and other tools having multiple cutting edges, also for blanking, drawing and forming dies, hot and cold trimmers and other shapes. Its resistance to abrasion is said to make it particularly adapted for gages and instruments of that character. The cast tools are furnished in a finished state ready for use or they are supplied in annealed form to the customer, who machines them to accurate dimensions and hardens them for use.

The castings have the appearance of smooth forgings and are said to be practically non-rusting and acid-resisting, and the heat-resisting qualities of the alloy are such that it does not scale in the fire, thus adapting it to milling cutters having thin edges. The steel may be hardened in oil or air, and it is explained that the processes of annealing and re-hardening may be repeated without the steel losing any of its properties. It is emphasized that the cutters and tools made by this method do not change their shape in hardening, thus reducing the labor required for finishing. The



Chrobaltic Alloy Castings. The cutter or tool is cast to practically the finished form, 1/16 to ⅛ in. of metal being allowed for machining

steel has a comparatively high scrap value in that the cast cutters can be remelted and used over again.

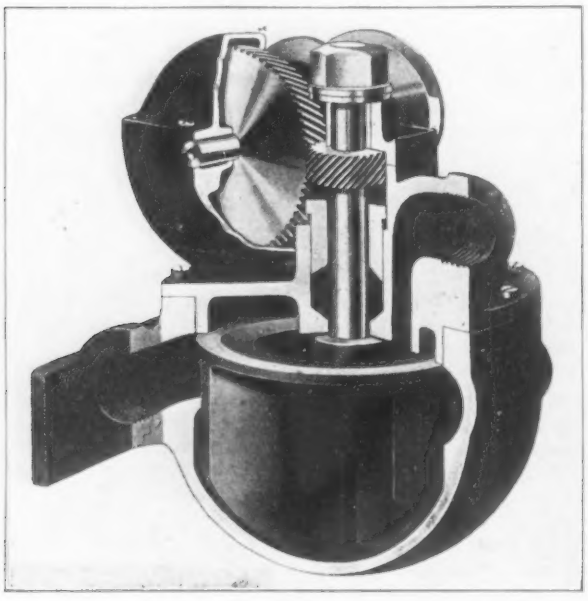
In comparing the cutting and wearing qualities of chrobaltic alloy with those of tungsten high-speed steel the manufacturer states that there is practically no difference where the ordinary temperatures in service are involved, but in abrasive services, as in the machining of phosphor bronze, white metals, etc., greater wear is obtainable from the chrobaltic cast cutters.

The cutter or tool is cast to practically the finished form, leaving from 1/16 to ⅛ in. for finishing, and the tools are machined to within a narrow tolerance before heat treating. Final finish, however, is obtained by grinding, as in the case of the regular high-speed steel cutters. Usually annealing is effected to 1832 deg. Fahr. in a closed muffle. Cooling is allowed to proceed slowly.

Pump for Cooling Compound

A new vertical shaft type of centrifugal pump for supplying a heavy stream of cooling compound to cutting tools has been perfected by the Volyum Pump Co., 419 West Liberty Street, Cincinnati.

The impeller, which is of the open type, is mounted on the lower end of the vertical drive shaft and extends



The Drive Is Through Two Spiral Gears Which Run at Right Angles. The ratio is three to one

the full depth of the semi-spherical body. There is no contact between the impeller and the body castings. There are two long bearings for the impeller shaft, both of which are above the water line, one being formed by the stuffing box gland just above the impeller, the upper end of the shaft running in a long bearing in the cap.

The drive is through two spiral gears, running at right angles with a three-to-one ratio. The large gear, mounted on the driving shaft, runs in oil contained in the oil chamber formed by the cover. Both shafts and

Centrifugal Pump of Vertical Shaft Type for Supplying a Heavy Stream of Cooling Compound to Cutting Tools. The suction pipe is located above the delivery pipe to eliminate loss of prime

the thrust bearings are lubricated by the circulation of this oil.

Standard drive is by a belt over a 3-in. flanged pulley, although a gear or sprocket wheel can be substituted for the pulley. The pump can be mounted on either side or end of a machine, the various angles of drive being obtained by swiveling the cover in relation to the body and by placing the pulley on either side of the cap.

The suction pipe is located above the delivery pipe thus to eliminate loss of prime, as the pump when brought to a stop retains a full body of liquid. The pump is made for ¾-in. pipe connection. Tests made at various heads from 4 to 12 ft., suction lifts of from 18 to 26 in. and pulley speeds ranging from 500 to 750 r.p.m., it is stated, showed a pumping capacity of from 5 to 22 gal. per min.

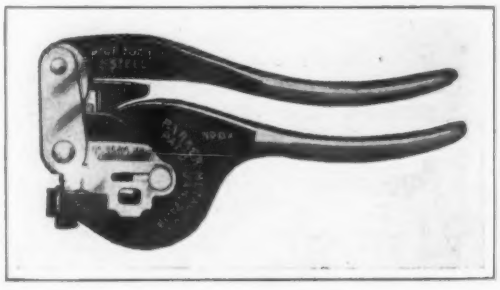
A New Adjustable Shell Reamer

An adjustable shell reamer which comprises three parts, the body, lock-collar and adjusting screw, in addition to the blades, is announced by the Cashman Tool Co., Waynesboro, Pa. The blades are adjusted backward instead of forward by one adjusting screw, which is graduated in 0.001 in. The adjusting screw has a right-hand thread, and the lock-collar a left-hand thread, the one interlocking the other. There is one wrench, one end being used for adjusting the screw, the other end for the lock-collar.

All blades are provided with a lip, thus to prevent chattering. The reamer is emphasized as affording wide and accurate adjustments from small to large sizes. The manufacturer states that it can be adjusted to 0.0001 in. as easily as 1/16 in., and as quickly. All parts are made interchangeable.

Improved Hand Punch for Metals

A hand punch for cutting holes in sheet metal manufactured by the Parker Supply Co., 785 East 135th Street, New York, was described in THE IRON AGE issue of March 20. A number of improvements have been made in the tool to increase its usefulness. A front



A Front Pointer and Side Gage Are Provided on This Center Punch to Eliminate Center Punching

pointer and side gage is now provided which does away with the necessity for center punching thus to save both time and labor. The gage also acts as a wrench for removing punches and as a screw driver for the replacing of dies. This screw driver attachment has been made particularly wide as it is pointed out that the end of a small screw driver often chips off when used on a die of this nature.

The set screw which held the punch in place in the former design has been replaced by a nut which holds the punch in a permanent rigid position, a feature emphasized as adding to the life of the punches and dies. The capacity of the tool operated by one hand is said to be a $^{17}/_{64}$-in. hole in 16 gage iron.

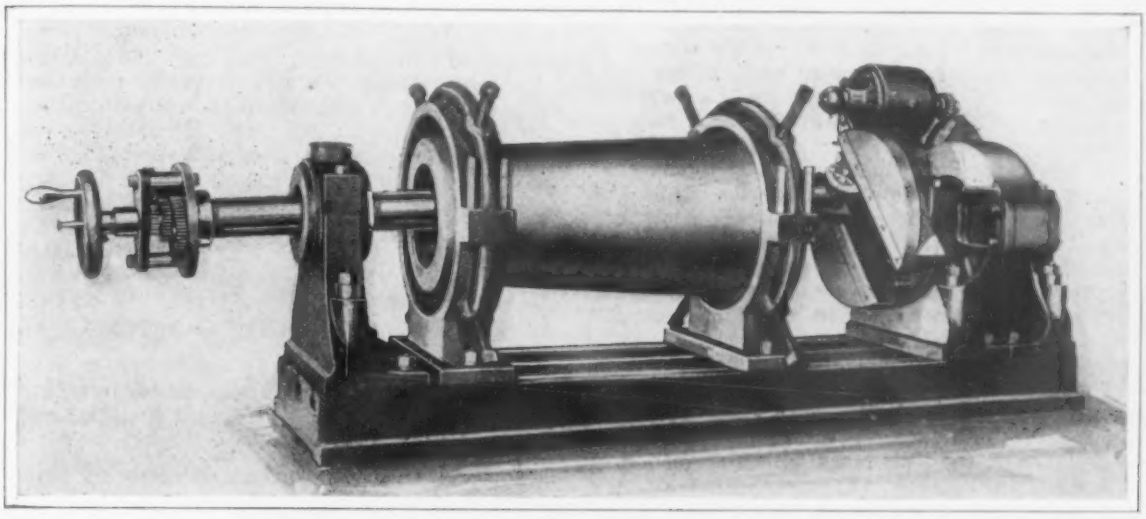
The report of the United Shoe Machinery Corporation for the year ended Feb. 28, 1919, shows earnings of $7,495,120, less than in 1917 and greater than in 1918, as revealed by the figures, $8,174,452 and $6,137,322. The balance per share on the common stock was equivalent to $4.25 in 1919, compared with $3.46 and $6.02 respectively in two previous years.

Gas and electric welding is the subject of issue No. 23 of Safe Practices, published by the National Safety Council, 168 North Michigan Avenue, Chicago.

Machine for Taper Boring

A boring machine that is adjustable for any taper ordinarily required is announced by the Pedrick Tool & Machine Co., 3640 North Lawrence Street, Philadelphia. Three pedestals support the boring bar and its driving mechanism and two steady rests hold the work. The bar is connected by a hinge joint to a sliding block in the face plate, the degree of taper being determined by the amount the block is moved from the center of the face plate. When the block is central the machine is adapted for straight boring work.

The bar is supported in the last pedestal by a bearing which allows the necessary amount of oscillation or orbital movement. Imbedded in a groove in the bar is a feed screw which causes the cutterhead to travel along the bar. The feed case on the end of the bar controls the feed screw regulating the amount of feed by a constant automatic movement changeable for roughing and finishing cuts. The machine may be belt or motor driven.



Machine Adjustable for Boring Tapers Ordinarily Required. In this view a 30-in. bore 9 in. in diameter at one end and 12 in. at the other is being machined with 3-in. boring bar. The bed plate is 28 x 96 in.

Expert Instruction in Mechanical Inspection

An advanced course in mechanical inspection, free to members of the new American Society of Mechanical Inspectors, will be started in September, with classes in the Engineering Societies' Building, 29 West Thirty-ninth Street, New York, and with the co-operation of the United States Bureau of Standards, whose laboratory and equipment will be used. Courses will be taught by foremost authorities in their lines, several skilled men having agreed to conduct one lecture each. These men will assist in establishing a standard and uniform course of instruction.

A preliminary course, now being conducted under the auspices of the society at the College of the City of New York, with Henry F. Winter, aeronautical engineer, in charge, closes June 27. The training covers the inspection of machined parts as practised in all modern plants, with particular reference to automobile and aircraft production.

The lectures take up the reading of blue prints, general methods of machine shop practice, the reading and uses of all micrometrical instruments, small tools, gages, jigs and fixtures, testing of metals and hardening of steel. The laboratory practice deals with micrometers, vernier calipers, depth gage and height gage, limit gages, thread gages, surface gage, universal bevel protractor, screw pitch gages, feelers or thickness gage, snap gages, mandrils, V-blocks, angle and surface plates, decimal equivalents of drills, combination sets, scleroscope, dial indicator, blueprints, blueprint abbreviations, tolerances, actual inspection of machined parts, and checking up from blueprints.

Arrangements for the course may be made with Mr. Winter, 35 West Thirty-ninth Street, New York

Iron Industry of Sweden

WASHINGTON, June 24—The iron industry of Sweden continues depressed, says a report made by Consul General Albert Halstead at Stockholm. The armistice eliminated much of the European demand for steel and the unsettled conditions in Germany and Russia have emphasized the uncertainty of the situation. Mr. Halstead also quotes the following statement of the Swedish Iron Association:

"Few orders and fluctuating prices. Our iron industry is working under especially difficult conditions, since the high cost of production hinders business to a great extent, more especially export. The prospects must be regarded as unfavorable, as a further increase in the cost of production is unavoidable on account of the 8-hr. working day which it is expected will be introduced shortly."

The report contains the following comparative table of Swedish iron and steel production for the first three months of 1918 and 1919:

Articles	Quarter ended March 31 1918 Metric tons	1919 Metric tons
Pig iron including smelting goods	206,600	159,700
Smelting pieces and rough bars	28,100	21,200
Bessemer and Thomas ingots	14,300	12,600
Martingot, including piece smelting goods	112,300	115,300
Crucible and electric ingots	2,200	2,500
Rolled and beaten	84,800	91,200

The pig iron production fell 46,900 metric tons or 22.7 per cent and rough bars 6900 metric tons, or 24.5 per cent. Exports show a similar decline, chiefly in pig iron.

Further important extensions in the Canadian steel industry are foreshadowed in a decision just made by the Lake Superior Corporation to begin work immediately on an extension of the Algoma Steel Co.'s plant at Sault Ste. Marie, Ont. The purpose of the extension is to make possible the production of structural steel up to 23 in. Work will be begun at once and the extension will cost several hundred thousand dollars, and is expected to be completed by November.

The Government is taking bids for the purchase and removal of buildings and equipment originally provided for the construction of the proposed gun plant, Neville Island, Pittsburgh, including boiler plant, heating and lighting equipment and other structures and apparatus. Major George T. Bergen, commanding officer, Union Arcade, Pittsburgh, is in charge.

Effective June 16 Ralph C. Velte was appointed assistant general manager of sales of the Valley Mould & Iron Corporation, Sharpsville, Pa., with headquarters at 509 Oliver Building.

Book Reviews

Industrial Good Will. By John R. Commons, University of Wisconsin. Pages 213, 5½ x 8 in., with 3 diagrams. Published by McGraw-Hill Book Co., Inc., 239 West Thirty-ninth Street, New York.

This is a new book on a subject which did not get much attention until the war made employers realize that the labor supply was not unlimited. For years there has been recognition of the value of business good will, commercial good will, trade name, trade reputation, trade marks, which often exceeded in value the physical plant and the inventory of the stock in hand. This form of good will existed between the employer and the public. "Industrial good will" exists between the employer and the employee and in the long run is economical, though intangible, preventing extensive labor turnover, so much discussed of late. In the language of the author, "how to make work interesting is just as much a field of investigation and experiment as how to invent a machine or lay out a plant. And business men, engineers and educators can be just as ingenious and successful in doing it. It is the big field of industrial psychology, which for the twentieth century opens up like the nineteenth for chemistry and physics."

The author treats of the old commodity and machinery theories of labor, the concern of the public in the treatment of workmen, the necessity for uniformity of conditions to bring up the laggard employer to standard, the promotion of the employee's welfare through various kinds of insurance, the provision of proper health conditions, education, instilling of loyalty and the injection of personality. He devotes several pages to pointing out the fallacies in the Karl Marx theory of socialism. The author has been classed as a theorist, but his prescription for modern industry has back of it years of first-hand study of the problems of capital and labor, albeit he has been a consistent partisan of labor unionism. He considers that "the new idea to-day is the interest and loyalty of workers," and would have employers appreciate that there is to-day a new idea of loyalty—"the loyalty of those to whom unemployment is no penalty."

The Human Machine and Industrial Efficiency. By Frederick S. Lee, Ph.D., LL.D. Pages 119, 5 x 7½ in.; illustrations and charts, 14. Published by Longmans, Green & Co., New York.

The author is professor of physiology in Columbia University and most of the substance of the book was given in two lectures before the Harvard Medical School in April, 1918. According to the preface, "many of the facts here presented relate to war industries, but they are none the less pertinent as illustrating the principles enunciated." The book is particularly interesting and valuable because it discusses the "human machine" from the standpoint of an expert on the human body. The reader realizes that such factors as fatigue, working power, and various physical influences have been studied scientifically and the conclusions reached are therefore especially convincing. By statistics of experiments the author seemingly proves the benefits from both standpoints of employer and employee of a minimum working day of eight hours, rest periods, day as opposed to night work, proper food, etc. An interesting feature is the account of experiments with a frog's muscle to determine characteristics of fatigue in the human being. The book is characterized by its dealings with the concrete, rather than with abstract generalities. The scientific facts are presented in popular parlance so that the average reader may well understand.

The Mineral Industry During 1917. Edited by G. A. Roush. Pages, xviii + 928, 6¾ x 9½in. Published by the McGraw-Hill Book Co., New York.

This is volume XXVI of this important statistical work which has appeared annually since 1892. The present edition does not depart from its usual scope and purpose. It covers the industries of the United States and foreign countries; the mineral producing statistics are given so far as possible, but because of the war much of the usual data was impossible to obtain and hence some of the tables are not as full as in former issues. The principal minerals are dealt with, those of less importance from a technical point of view having been omitted. There are 42 contributors to this issue. There are three special chapters on "Ore Dressing and Coal Washing," "Data on the World's Principal Mines" and "Mineral Statistics."

The American Year Book, 1918. Pages xviii + 850, 6 x 8 in. Published by D. Appleton & Co., New York. Edited by Francis G. Wickware.

The scope of this important annual volume has been broadened decidedly in this issue, as well as in that of the year before, due to the influence of the war. In this last volume the war is almost the dominant factor in every chapter. Intended for writers and seekers for information of almost any kind, its value is appreciated by a host of users. It is a record of progress in all fields, in scientific particularly, but in political and statistical in a more limited way. It appeals to students and is a handy reference book for consultation on many questions of fact. Its 31 chapters cover American history, foreign affairs and international relations, several economic subjects, military and naval affairs, most of the familiar sciences, as well as religion, art, literature and languages. The thoroughness and field of its subject matter can be appreciated from the fact that its contributors number 117, all of them classed as experts in their various fields.

The Chemical Analysis of Iron. By Andrew A. Blair. Pages 318, 6½ x 9 in. Published by J. B. Lippincott & Co., Philadelphia.

This work is regarded as a standard in the best sense of the word, and is a complete account of all the best known methods for the analysis of iron, steel, pig iron, alloy metals, iron ore, limestone, slag, clay, sand, coal and coke. The first edition of this work appeared about 30 years ago. The present edition is the eighth which brings it up to date, for it contains not only many of the familiar methods but others which are new and important. There have been so many improvements in the methods for analyzing not only the usual irons and steels but the so-called alloy steels, and ferroalloys have become so prominent that a recasting of the work was found necessary.

Technologic paper, No. 126, of the Bureau of Standards entitled, "A Study of the Goutal Method for Determining Carbon Monoxide and Dioxide in Steel" is a discussion to the effect that the method does not give the true carbon monoxide or carbon dioxide content of steels but instead a fictitious value for these gages, since they appear to be generated by action of the cupric salt on the carbides present. The amount of this action varies with weight of sample relative to amount of solvent; with the time of boiling solvent; and with carbon content of the metal.

"Aluminum and Its Light Alloys" is the subject of circular No. 76 of the Bureau of Standards. It deals primarily with the physical properties of the metal and its alloys and all other features, except a few statistics of production, and such methods of manufacture, presence of impurities, etc., are discussed only in their relation to their physical properties. The chapters cover the metal itself and its sources of production, its metallography, chemical properties, physical properties, technology, properties as affected by mechanical work and by heat treatment, investigation of alloy series, commercial alloys, etc.

The twentieth edition of "Trautwine," the civil engineer's pocket-book, has been enlarged by about 300 pages of new matter treating of railroads, including such subjects as tracks, turnouts and crossings, curves, circular and spiral, signaling, yards and stations, rolling stock, train resistance, train dynamics, train operation cost, construction cost and statistics. The book is published by the Trautwine Co. 257 South Fourth Street, Philadelphia.

WIRE COMPANIES MERGED

Clinton-Wright Co. Organized to Carry on the Business

WORCESTER, June 24.—The interests of the Wright Wire Co., Worcester and Palmer, Mass., the Morgan Spring Co., Worcester, Mass., and the Clinton Wire Cloth Co., Clinton, Mass., have been merged into a new corporation to be known as the Clinton-Wright Co., organized under Massachusetts laws with capital stock of $12,500,000, divided into three classes of stock, $3,500,000 first preferred, $1,500,000 voting preferred, and $7,500,000 common. The preferred will have par value of $100, the common a par value of $50.

The officers, as far as selected, are: President and general manager, Evan F. Jones, treasurer and general manager of the Morgan Spring Co.; chairman of board of directors, George M. Wright, president and general manager of the Wright Wire Co.; vice-president and sales manager, John A. Denholm, assistant treasurer and sales manager of the Wright Wire Co.; vice-president and assistant general manager, George F. Wright, assistant general manager of the Wright Wire Co.; directors, these officers and George F. Naphen, Liggett & Drexel, bankers, New York, who effected the merger, Frank A. Drury, president of the Merchants' National Bank, Worcester; Paul B. Morgan, president and treasurer of the Morgan Construction Co., Worcester; and Charles F. Fairbanks, Lexington, president and treasurer of the Clinton Wire Cloth Co., and three others to be named later, representing banking interests, holders of the stock. Other officers will be chosen at a meeting later in the week.

The official announcement of the consolidation states that the new company will acquire all the assets of the combined companies, together with those of the Morgan Spring Co.'s subsidiaries, the National Mfg. Co. and the Miller Wire Cloth Co., both of Worcester. All of these assets have been paid for in cash, and the new corporation will begin business with an excess of $4,000,000 in net quick assets, exclusive of plants and machinery. There has been paid in $1,500,000 as additional working capital to provide for extensions, all of which will be built at the Palmer plant of the Wright company, where there is ample land for the purpose. The first preferred stock, the announcement says, has been sold to a New York banking syndicate. Some of the common stock will be offered in the market at $35, the remainder will be taken by Liggett-Drexel and interests identified with the constituent companies.

The new company will employ about 3000 hands and will have a product of about 60,000 tons per annum. The combined net earnings have been $1,500,000 on a gross business of between $12,000,000 and $15,000,000.

The attempt to consolidate the independent wire companies of Central Massachusetts has been in progress for several years, and previous efforts have included the Spencer Wire Co. Recent reports included the possibility of the Wickwire Steel Co., Buffalo, entering the merger as a source of raw materials from the ore to the rod, but this proved to be without foundation in fact.

New York Steel Treaters' June Meeting

The first regular monthly meeting of the New York Chapter of the American Steel Treaters' Society since its organization in May was held at the Engineering Societies Building, Friday evening, June 20. Three papers were presented and informally discussed.

"High Speed Steel—Its Metallography and Heat Treatment," by G. J. Horvitz of the New York Testing Laboratories, was illustrated by lantern slides. It is published in abstract on other pages of this issue. In the brief discussion it was stated that, as between electric and crucible high speed steel, the testimony of most users is that it is difficult to detect any difference. It was also stated that practically all makers of tools in this country have virtually abandoned the use of barium chloride as a heating medium for high speed steel because of its tendency to cause pitting of the metal.

"Heat Treatment as Applied to Railroad Materials," by C. B. Bronson, consulting engineer's office, New York Central Railroad, New York, was an interesting presentation of the extent to which such material is now carefully prepared for use. He discussed the treatment of rails. This paper will have further attention in a later issue of THE IRON AGE.

"The Effect of Certain Elements on the Properties of Steel" was a clear presentation by N. J. Gebert, metallurgical engineer with Herman A. Holz, New York, of the effect of the important metals and metalloids. He brought out a number of new features as applied to metallurgy and heat treatment.

The next monthly meeting will be held in September. The chapter has made a good start, having over 75 members already enrolled. The executive committee is announced as consisting of the president and secretary of the chapter, Frank B. Fahy, consulting engineer, New York, and L. R. Seidell, New York Testing Laboratories, New York, respectively; C. H. Schultz of H. Boker & Co., Brooklyn; R. L. Angell, chief metallurgist E. W. Bliss Co., Brooklyn, and Edwin F. Cone, associate editor, THE IRON AGE, New York.

Norton Companies Reorganized

The conduct of the business of the Norton Grinding Co. has been taken over by the Norton Co. and hereafter the grinding machine and grinding wheel business will be conducted as a single enterprise under the name of the Norton Co. The Norton Co. has for some years owned practically all of the stock of the Norton Grinding Co. and the directors have been the same. They remain unchanged. Reorganization has been made in the active executive officers of the Norton Co. as follows:

Chairman of the board, George I. Alden; president and general manager, Charles L. Allen; treasurer and general counsel, Aldus C. Siggins; secretary and works manager, George N. Jeppson; vice-president and foreign manager W. L. Neilson, Leicester, England; vice-president and general sales manager, Carl F. Dietz, who will conduct the sales of both companies; sales manager of the grinding wheel department, Herbert Duckworthy; sales manager of the grinding machine department, Howard W. Dunbar; consulting sales engineer to Mr. Dietz, Clayton O. Smithy; controller, Henry Duckworthy; manager of abrasive plants and research engineer, with office at Worcester, Lewis E. Saunders, Niagara Falls, N. Y.

Formal announcement is made of the establishment of a factory at Hiroshima, Japan, where the company has acquired control of a going grinding wheel business. Dr. Ross C. Purdy leaves the exclusive employ of the Norton Co. as head of the department of ceramics, to assume private practice as consulting engineer with headquarters at Buffalo, but will be the company's consulting engineer.

Taylor & Boggis Plants Sold

The Taylor & Boggis Foundry Co., Cleveland, has sold its plants to a new company at the head of which is I. T. Kahn, president the Columbian Hardware Co., and of the Republic Structural Iron Works Co. The operation of the foundry company will be continued under its present name. The Taylor & Boggis Foundry Co. was established in 1865 and is one of the oldest foundry companies in the Central West. G. J. Morgan is president, H. J. Boggis, vice-president, and B. F. Wade is treasurer. The company owns and operates two foundries and a builders' hardware manufacturing plant. Mr. Kahn will be the new president of the foundry company, Joseph C. Hostetler, vice-president, Thomas L. Sidlo, treasurer. Fred Blumdull, the factory manager, will remain with the company and also be its secretary. The Columbian Hardware Co. manufactures vises and anvils, automobile forgings and other products.

ESTABLISHED 1855

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Peace and Business

The signing of the peace treaty by Germany will favorably affect business through several channels. The mere event will operate to release a great deal of business that has been held back. The lifting of all or nearly all the blockades will allow trade that has been in abeyance to be carried out. A great deal of financing, particularly that which is required to enable foreign countries to make purchases in the United States, will be approved.

To the man actually engaged in buying, with his finger constantly upon the pulse of the markets, the signing of the peace treaty by Germany may seem merely like an incident. To many who have a voice in business counsels it is much more. Many corporations have had plans formulated for doing one thing or another, awaiting the approval of a board of directors, composed partly of men who decide upon very general principles how they will vote. To many such men the war is not over until the peace treaty is signed. It was the common view before the war ended that the signing of the peace treaty, rather than the cessation of hostilities, would mark the beginning of the real business of peace. It seems to be entirely fair to assume, therefore, that in the next few weeks many favorable decisions will be voted, in the direction of business expansion.

The expansion in international trade, due to the lifting of blockades, must prove an important force, with wide ramifications. The trade will necessarily be on a small scale at the outset, but world commerce is already very large. In the past few months the total of international trade must have been much larger than before the war. In the case of the United States, for instance, the foreign trade in the first four months of this year, imports plus exports, was at the rate of $10,500,000,000 a year, while the best year before the war, 1913, showed $4,650,000,000.

Much progress has been made very lately by American bankers in the matter of financing loans for Sweden, France, Roumania and Italy. No doubt the carrying out of the projects was predicated upon the signing of the peace treaty, but at any rate all such financing will certainly be stimulated, and for much of the business that has been in sight such financing is absolutely necessary.

The new world that was to be established upon the principles for which the war was fought is now to have its inception. During the seven months of discussion and bargaining that followed the cessation of hostilities, no encouragement was furnished to anyone to act as though the new world had begun its career. The period rather furnished its discouragement. It is now, rather than last November, that marks the beginning of the new conditions, and the thrill of encouragement must run throughout the world. Such revival in business as occurred from last November to date was despite the conditions rather than because of them. Those conditions now yield to actual peace conditions. So far as business is concerned, it is only a detail that hard work may be required to make Germany live up to the terms of the treaty year by year.

Values and Inflation

The continued use of the word "inflation" has a misleading influence. There is no accepted meaning of the word that does not distinctly suggest two attributes, that the operation is improper; second, that the state is only temporary. The only dictionary definition of "inflate" that can be applied is "to expand or increase abnormally or improperly; to extend imprudently; as, to inflate the currency, prices, etc."

It will readily be admitted that what has occurred may be called "abnormal," that is, unusual. Such a world war, and the means used to prosecute it, were certainly unusual. It does not follow that when something unusual occurs conditions promptly return to the former status.

What has been learned in the past few months is that the great rise in commodity prices and wage rates that occurred during the war was not to be followed by a corresponding decline. It had been supposed by the majority that a decline would occur of its own accord. Now it is known that the circumstances inviting or permitting a decline do not exist. As this fact is taught, the notion is fostered that deflation is merely postponed, that the influences that bolstered prices are forces whose influence will disappear grad-

ually instead of suddenly. That is not the correct concept. There is no reason to suppose that these forces will ever disappear entirely. Through the centuries commodity prices, measured in gold, have risen. One does not speak of that as inflation, because inflation has a different meaning, and is not applicable to that process. It is unfortunate that the rise of the past few years has that unfortunate word fastened to it.

Confusing to the formation of a true concept of what has occurred is the common knowledge that periods of declining commodity prices and wage rates do occur. No one ventures to assert that such movements have been abolished, and there is a disposition to assume, loosely, that whenever the next period comes it will represent the deferred deflation from the present "inflation." What may occur between now and then is ignored, yet it is in this period that lies ahead that any inflation that requires deflation is likely to occur. Belief, therefore, that some years far in the future will witness declining prices and wages does not require belief that the present rates require deflation.

The maintenance of prices and wages, so greatly risen in the past few years, is due to expansion in many things, in the volume of gold, in the volume of circulating medium, in the amount of bank deposits subject to check, in Government loans and in many other things. These things, on an average, will not be greatly reduced even in a period of many years. For instance, Government loans may gradually be liquidated, but bank deposits are likely to continue to increase.

Before the war the total annual disbursements of the Government were running at about $700,000,000 a year. Interest on Government bonds outstanding now amounts to a larger sum, outside of sinking fund and the vastly increased general expenses of the Government. All this forces the circulation of money, which exerts a favorable influence upon prices and wages.

Apart from interest disbursements, the existence of the Government debt is a supporting factor. There are economists who assert that the wealth of a country is the appraisal of its material things minus the public debt. There are others who claim the public debt should be added instead of subtracted. The millions of people who before the war owned the wealth of the country, through possessing shares of stock, titles to real estate, etc., now own, in addition, billions of dollars of Government bonds. Are they correspondingly poorer?

From the expansion that has occurred, lowering the value of the dollar when converted into commodities or labor, it must follow that the value, in dollars, to be assigned to the wealth of the country must be increased. With respect to such values, the income tax law exerts a wonderfully stimulating effect through its taxing paper profits when property is converted into dollars. If the owner of a factory were to trade it for bushels of wheat or days of labor he would receive less than in 1913 and thus would lose, but if he should convert it into the number of dollars that the bushels of wheat or the days of labor could be exchanged for, he has a large paper profit and must pay a large tax. Accordingly a large number of sellers are prevented from selling. As long as this law stands there will be many buyers and few sellers. Property values will be marked up rather than down, thus exerting a favorable influence upon commodity prices if not also upon wage rates. We are not deflating but adjusting things to a new situation, which is due to expansion rather than to a temporary inflation.

British and American Steel Capacity

Changes in the steel output of Great Britain have been pronounced as a result of the war. This is particularly true as to the character of the production rather than the quantity. Acid open-hearth steel has always been the favored product with British steel users, even though necessarily made largely from imported ores. Before the war it averaged about 50 per cent of the total Bessemer and open-hearth production. War conditions, however, forced the use of different ores, mostly domestic, and the conversion of many open-hearth furnaces from acid to basic bottoms. As a result the acid output from such furnaces fell to only about 40 per cent of the total of Bessemer and open-hearth steel in 1918. It will be interesting to observe whether basic steel will be able to maintain its new position. In the United States basic steel constituted about 72 per cent of the total Bessemer and open-hearth output in 1917.

The most striking change has been in output of British steel from electric furnaces. From 22,000 gross tons in 1915 the total of electric steel ingots and castings had grown to 152,922 tons in 1918, or nearly seven fold. However, the United States shows a greater gain; its electric steel output expanded from 69,412 tons in 1915 to 304,543 tons in 1917 and to an estimated total of at least 600,000 tons in 1918. Nor does the 1918 British electric output equal that of Germany, which was 221,824 tons in that year. Whether Germany or England will occupy second place in this industry in the future depends on many conditions, with the probabilities favoring the Germans from the present outlook. Canada's output was about 120,000 tons last year, or not far below Great Britain's.

The war accelerated the need for steel castings so that the 1918 British output was about 4 per cent larger than that of 1917, or 261,950 tons, as compared with 186,920 tons. This increase nearly parallels that of the United States, where the 1917 output was 5 per cent greater than that of 1916. Steel castings as a war output were by no means developed in Great Britain as in Germany. If reported statistics are correct, the 1917 output in Germany was 1,495,000 tons, or over five times that of 1913, which was 298,000 tons. In the United States, with its great steel foundry capacity, the steel casting output in 1917 was 1,441,000 tons.

Much was heard during the war as to the probable expansion of the steel producing capac-

ity of the British industry, some reports placing it at not less than 50 per cent. The 1918 data disprove these estimates. Last year the total British steel output was 9,591,428 gross tons, the record having been made at 9,752,328 tons in 1917. This is an increase of only about 25 per cent over the best pre-war record of 7,663,876 tons in 1913. Comparing the 1913 and 1917 outputs of the United States it is found that the expansion was over 40 per cent, a decided contrast.

Conservative estimates place the British steel capacity at not over 12,000,000 tons per year. Present conditions in that country prevent a full output. This is also still more the case in Germany as well as in France and Belgium, where many plants are still mere wrecks. It would seem, therefore, that the United States, with a capacity of 49,000,000 to 50,000,000 tons per year, is in a decidedly advantageous and dominant position in the world's steel industry. The world's steel capacity may be estimated at 98,000,000 tons today, assuming that the works of Belgium and France are restored and that Russia, if ever stabilized, could produce 5,000,000 tons, as formerly. Meanwhile the United States has considerably more than 50 per cent of the effective steel making capacity of the world, as against 42 per cent just before the war.

The Safety Engineer

One who, while not himself a safety engineer, has had a broad experience in accident prevention in a great manufacturing establishment, makes the emphatic statement that with safety appliances for machine operators the really important factor very often is not the device itself but the safety man or foreman or superintendent whose duty it is to instruct and direct the workers in regard to such devices. Tact and the power to create interest and co-operation are everything. Insurance men complain that often superintendents, while issuing strict orders as to the use of safeguards against accident, or the foremen who are charged with carrying out such orders, are at heart indifferent. Employees sense the condition quickly enough and pay scant attention to regulations. A safety engineer in applying new means of protection can stir up rebellion against the innovation, and this happens too often. On the other hand the superintendent or foreman who has accident prevention at heart will be able to deal with the worker who will not obey orders, and the right kind of safety man can interest the operator and secure his assistance instead of his antagonism. In one case the safety man has worked so successfully among the users of machines with special liability to accident, notably presses and punches, that the operators are enthusiastic in the development of still better safety appliances. One expedient is by veiled suggestion to give a worker an idea which, when worked out, the latter may well claim as his own creation. This engineer gets results, as the record of his plant has proved.

Piece work operators often regard safety devices with suspicion, in the belief that they tend to slow up production. In some cases they do make dangerous short cuts impossible, but ordinarily they have little effect on the speed. The efficient safety man can help out in maintaining production, perhaps by studying the cycle of operation, and occasionally he may find a way to secure better speed than ever. The main thing in accident prevention, as with other features of management, is to make sure of intelligent co-operation.

French Steel Works on Old Lines

All information from France through American engineers who have visited that country this year and from French engineers who have been in the United States is that the policy as to the reconstruction of French iron and steel works is not yet determined. The question of financing is full of difficulties, with prices treble those of normal times. When President E. A. S. Clarke of the Consolidated Steel Corporation visited the Homécourt Works of the Compagnie des Forges et Acieries de la Marine et l'Homécourt, two months ago, no decision had been reached as to the extent or the rapidity of reconstruction after the spoliation by the Germany army. Speaking generally, indications are that the policy will be, throughout the French steel industry, to save as far as possible on first cost, evidently in the expectation of making the same use of hand labor as formerly. For example, the skip hoist, which has been a feature of every new blast furnace in the United States in the past 20 years, is not known in France and is not being considered for the new furnaces that must be built there. If French labor moves very rapidly in the direction taken by the unions there recently, the iron and steel companies are likely soon to face much higher costs than were dreamed of in the old days. It will not be long therefore before the policy of saving on first cost of reconstructing iron and steel works will prove to have been poor economy.

Education and Work Hazard

In an important American manufacturing city are a number of large plants in which safeguards against accidents have been provided on an elaborate scale. Good minds have studied the problem and their ideas have been put into practice at large cost. Machinery has been made as near fool-proof as possible; stairs, passageways and elevators are as they should be, warning notices are posted wherever they are needed. Careful inspection would show little advantage in any one plant over the others.

In the rush of production incident to the war the normal accident hazard in industry increased sharply. It could not be otherwise. Men and women were working under crowded conditions, at high tension, under the combined stimulus of the unprecedented necessity of production, the driving of superintendents and foremen and the reward of the highest wages. There was every reason why the curve of accident should ascend.

In the group of plants in question the percentage of accidents did increase in all but one plant. There the curve, already falling, continued

to fall. The occupational hazard of the works was fully as great as that of the others, perhaps greater than in any of them. A study of the case, however, revealed the reason. This one company had gone a step farther than the others in its accident prevention work, by conducting a systematic, unremitting campaign of education among the workers, week after week, month after month, year after year. Frequent workmen's meetings to discuss and suggest and to listen to matters relating to the dangers of the employment, and how to avoid them; frequent contact with the safety engineers for individual instruction and similar attention from the foremen, had combined to establish in the minds of the men a keen sense of caution. The cumulative effect of the campaign, covering several years, was at high point as the war activities commenced, and the result was a continued decrease in percentage of accidents, though doubtless the accident rate was greater than it would have been in the same works had business continued at the usual pace. The descent of the curve was less rapid, but the figures proved conclusively, it would seem, that persistent schooling is just as important as safety devices and danger placards.

British Steel Costs and the Coal Problem

LONDON, ENGLAND, June 16.—The question of coal costs, the reduction of working hours, the refusal of men to work overtime, etc., all make it difficult for steel makers to gage what the cost of production is going to be a few months hence. At a recent meeting of the South Wales Siemens Steel Association it was decided to urge the Coal Commission to make no recommendation involving government or bureaucratic control of the production and distribution of coal or coke. It was also agreed to send a letter to the chairman of the Coal Commission pointing out that the association comprises 14 works and employs about 16,000, while it supplies practically the whole of the tin-plate and a large proportion of the galvanized sheet trade.

The cost of producing sheet bars in this country is stated to have increased about £8 per ton since 1914 which it is believed is as great as the total present cost of production in the United States. This increase is almost wholly due to the enhanced price of coal and coke.

Some interesting evidence was given at the Coal Commission by Sir Hugh Bell on behalf of the National Federation of Iron and Steel Manufacturers. He stated that he viewed with grave apprehension the tendency to replace the action of economic law by government interference. The task of working a coal pit was not a matter of routine which could be laid down by government rule but an art in which initiative must be left with individual management. He considered there could be no graver decision in the whole realm of economic policy than the application of new and untried methods of organization to so important a factor in the economic life of the country, while the present financial position of the country rendered the present time particularly unsuitable for carrying out a scheme of this magnitude.

As regards considerations affecting the iron and steel trade, the witness stated that the development of the steel works during the war, which when completed would give us an annual capacity of 12,000,000 tons of steel compared with 7,500,000 tons a year before the war meant that the trade would make a much greater call upon our coal resources than in the past. Again, the iron mines abroad which provide the material for nearly 40 per cent of our production had been seriously affected, in raising and transporting minerals, by the shortage and high price of British coal. Previous to the war he stated the United Kingdom exported about 5,000,000 tons of iron and steel compared with the United States total of about 2,700,000 tons.

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Liquidating War Contracts

WASHINGTON, June 24—The War Department has liquidated almost one-third of the contracts which were suspended as a result of the cessation of hostilities. Out of a total of $3,809,110,000 in contracts suspended, the liquidation aggregates $1,223,591,000, or 32.1 per cent. On this liquidation the settlement costs to the Government, according to the announcement of the War Department, aggregated $151,562,000, or 12.4 per cent.

Up to May 31, according to a statement of the War Department, a total of 16,711 suspended contracts and agreements had been liquidated. More than half of these, 8,937, were settled without cost to the Government, a suspension in these cases having caused the contractors no loss. The fact that a large number of such contracts are included in those liquidated to date partially accounts for the comparatively high rate of saving, 88 per cent.

Salvage of War Steel Under Way in France

The United States Liquidation Board Has $1,000,000,000 Worth of Property to Sell—Restrictive Policy of the French Government

WASHINGTON, June 24—Out of the devastation of the battlefields of France, peace is mining steel. This is one of the most interesting features of a detailed report which Commercial Attaché C. D. Snow, at Paris, has made to the Bureau of Foreign and Domestic Commerce, concerning the present situation in France. The report is based on a personal visit to large sections of France, and attempts to answer many questions which American business men have been asking concerning opportunities in that country. The document is of great interest to the iron and steel industries because it dwells at length upon the work of reconstruction and its demands upon those industries. It also touches upon the vital problems of the disposition of the American Army stores in France, as well as on the French policy of restricting imports.

Large Scale of Salvage Operations

"Since the armistice," reports Mr. Snow, "salvaging of metal on a large scale has been going on in all of the war areas of the west front. Thousands of tons of scrap steel have been salvaged from all the battle fields. A good share of this salvage work has been done by the troops of the Allied armies, but also a large amount of it has been done by the German prisoners of war. At practically all the railroad stations in the neighborhood of Etain and Bar-le-Duc trainloads can be seen of the crooked, rusted barbed wire entanglement rods, stacked up like cordwood, waiting for shipment. There are small mountains of miscellaneous scrap iron, and piles of heavy corrugated steel sheets are a characteristic sight in salvage dumps and railroad yards throughout the battle regions. In the center and toward the eastern end of the line, this work has been carried nearer to completion than at the northwestern end. In the northwest, along the British front, the salvage work has proceeded a bit more slowly, perhaps, but certainly not less thoroughly. In the winter and spring just passed, German prisoners of war were going over the shell-shot battlefields which had been a part of the British front, tearing down the corrugated iron shelters, picking up "duds" or unexploded shells, clearing the thickets of barbed wire and chevaux de frise, storing and piling up all the salvaged metal in the dumps and loading it on the freight cars and canal or river barges. In the salvage dumps you can see wrecks of camions, tanks of all descriptions, great piles of metal helmets, rifles, bayonets, knives, shells and shell cases, machine guns, and in fact all the metal debris of warfare. But the one lasting impression made on most observers is that of acres of corrugated steel sheets and barbed wire, and the twisted rods around which the barbed wire entanglements had been made. In a good many areas, the artillery fire had been so intense that the soil has been ruined for agricultural purposes. In such cases, the salvaging is simply to remove the dangerous explosive agents and recover the metal junk. In the agricultural districts, however, in cases where the shelling was comparatively light, and the land had been dug up to make trenches, the salvage work is closely tied up with that of agricultural reconstruction.

"Another branch of reconstruction, which has been carried forward rapidly, through the free use of labor troops, and the assistance of German prisoners, has been the repair of the roads. Hundreds of miles of roads that had fallen into a bad state from heavy traffic, or from shell fire, and from lack of repair work during the war, have been put in good condition since the armistice. American steam rollers, tractors, stone crushers, etc., have played an important part in road building."

American Surplus Stocks Worth $1,000,000,000

Mr. Snow also goes into detail concerning the sale of surplus stocks by the American, French and British armies in France: "I have been told that another big factor in the French market situation to-day is the stocks of engineering equipment and other merchandise in the hands of the United States Army, the French Army, and the British Army. I have been told that the United States Liquidation Board and the general sales office of the A. E. F. with headquarters in Paris have upward of $1,000,000,000 worth of property to sell. The liquidation board has been working with the French officials to come to a basis of agreement as to how the supplies may be disposed of. These goods were all brought in here for army use, without payment of customs duties, and in addition to various installations and used equipment there are great storehouses in various parts of France full of different kinds of goods that had been stored in some instances in quantities for an additional year of war if necessary. The French, of course, are anxious to get as much of the engineering material and other supplies as possible, as quickly as possible, where they meet definite, urgent construction needs. On the other hand, there are some lines on which the French manufacturers have protested that the release of the army stores at low prices will ruin their market. Automobiles and motor trucks, of which our army has so many, are much discussed. The French Government, of course, exercises control over the whole question of sale of this equipment. There is a possibility that the bulk of the material will be disposed of through French Government channels. [Thus far, however, the French Government has refused to permit to be marketed in France any of these machines.]

"Our army's engineering material is infinite in variety, including everything from hand tools up to the largest cranes and docks and floating equipment and steel buildings, various kinds of machinery, great quantities of light railroad equipment, some paints and varnishes, chemicals and colors, soaps, bags, stoves, greases, optical goods, photographic apparatus, etc. In ordnance lines there are complete plant equipment of two or three of the biggest machine shops in Europe and no small amount of carriage, wagon and horse equipment. There are the laboratory and chemical equipment of our Chemical Warfare Service, the bicycles, motorcycles, automobiles, trucks, and camions of our motor transport corps; trucks and cranes, tanks, engines and rolling material of our railroad transportation corps; telephone and telegraph equipment of our signal corps; motor and fuel oils, parts and aero-repair plants from our aviation corps.

"In addition to the supplies in the hands of the A. E. F. it should be remembered that there are similar articles, as a rule in not large quantities, in the hands of the French Army and in the hands of the British A. E. F. The French Army is disposing of its goods from day to day and the British authorities are negotiating for the disposal of their equipment here in the same manner as our liquidation board. Sales of French equipment are reported already in excess of 500,000,000 francs, and the minister of finance has estimated

the total budget receipts for liquidation stocks at 2,000,000,000 francs. Our army has already sold here horses and other commodities bought in France on which no questions of customs duties are involved, such sales meeting with the approval of the French Government. The American business men that I have met view these army stocks as an important factor in many lines, but none of the dealers with whom I have talked feel much concern over it. I talked with several manufacturers who said they would be glad to have the United States Army sell the big quantities of stuff in their lines, although it might take away the market for a while. They figured that it would introduce their products and that they would subsequently get large new upkeep orders. In other lines of engineering equipment even fairly large quantities look small in the light of the heavy absorptive power of reconstruction."

Chances for American Business in France

Concerning general business opportunities in France, Mr. Snow reports that there was an unwarranted optimism in the United States as to the volume of business that would be available at the cessation of hostilities. "It was forgotten," he says, "that reconstruction was not something that could be determined upon, financed and set in motion without a moment's delay. This reconstruction work has proceeded much more slowly than a good many American business men had anticipated. It was found that in a good many lines in France, just as at home, the shelves, instead of being bare, were pretty well stocked by foresighted buyers, who had anticipated even more difficulty in getting goods for another year of war and had loaded up while they had a chance. The policy of restricting imports was not suddenly abandoned; instead, it was intensified in some directions. In the face of all this, many dealers have allowed their early optimism to swing into dark pessimism; but in my judgment the latter is no more warranted than the over-optimism of six months ago. France needs the American market for its exports and France needs American goods, and trade relations between the two countries should be better, not worse."

Ohio Steel Products Co. Sold

The Ohio Steel Products Co., Mineral Ridge, Ohio, has been purchased by a company of Youngstown men of which John A. Logan has been elected president and treasurer and Clyde E. T. Tousley, vice-president and general manager of sales. The former owners, A. G. Webb, Cleveland, and L. H. Young, Mineral Ridge, disposed of their property to devote more time to their other interests. The present name of the company will not be changed, but the capitalization will be increased from $100,000 to $400,000. Additional land has been purchased, extensions will be added and new machinery installed.

The company has been making tubes and tubular products and special shapes, and the new company will make a specialty of acetylene welded tubing. The automobile industry will use its products for such parts as steering posts, exhaust pipes, windshield tubing, etc. The new directors, besides Messrs. Logan and Tousley, are: S. D. L. Jackson, Frank D. Zug and Myron S. Curtis.

Mr. Logan's grandfather, Chauncey Andrews of Youngstown, built and operated the Andrews & Hitchcock Iron Co. Mr. Andrews also had extensive interests in ore and coal properties and built the Pennsylvania Railroad through that part of Ohio. Mr. Logan is also a descendant from Gen. John A. Logan of the Civil War and Major John A. Logan, Jr., of the Spanish-American war. The present Mr. Logan served in the recent war as major in the 37th Division. He is also vice-president of the Carbon Limestone Co.

Before the war Mr. Tousley was with the Carnegie Steel Co. and was a lieutenant in the same division with Mr. Logan. Since returning he has been manager of sales extensions Trumbull Steel Co., Warren, Ohio.

Tariff Hearing Postponed

WASHINGTON, June 24.—Action on the special protective tariff bills for the magnesite, tungsten, manganese, potash, chemical and dyestuffs industries has been postponed until July by the Ways and Means Committee of the House of Representatives. After two weeks of testimony concerning the need for safeguards against the resumption of German competition, the committee found that there were still more witnesses to be heard. These probably will receive a hearing some time after July 10. By that time the hearings already held will have been printed, and the committee hopes to determine its recommendations to the House before August.

The chief issue is the question of supplementing the protective tariff with a licensing system. Concerning this there was much difference of opinion both on the part of witnesses and on the part of the members of the committee.

The hearings on the general revision of the tariff which the majority leaders have announced will be made at the present session, will not begin until August, if then. The preliminary work for such hearings has proved greater than the committee experts expected, and this has resulted in the postponement.

Two Cleveland Iron Foundries Merge

A merger of the Acme Foundry Co. and the Palmers & DeMooy Foundry Co., both of Cleveland, has been effected and on July 1 a new company to be known as the Acme-Palmers & DeMooy Foundry Co., with a capital stock of $400,000, will take over the entire capital stock of the two companies. For a time they will concentrate all operations at the plant of the Acme Foundry Co., which will be enlarged and improved to handle the combined business. The Palmers & DeMooy Foundry Co. was organized 37 years ago by V. T. Palmer, William DeMooy and George H. Palmer, and for a number of years has been under the active management of W. B. Greene, secretary and treasurer. The Acme Foundry Co. was organized 20 years ago by William Greenbaum, C. K. Sunshine and L. G. Kraus and has been managed by William Greenbaum, secretary. The new company will be under the management of W. B. Greene, as president, and William Greenbaum, as secretary and treasurer, and will continue to specialize in the manufacture of light gray iron castings.

Active Demand for Lap-weld Pipe

YOUNGSTOWN, OHIO, June 24.—Demand for lap-weld pipe in large sizes for oil-country users continues to be the dominating feature of the iron and steel market in the Mahoning valley. Practically every lap-weld pipe mill in the district is being forced to maximum production at this time. About 1500 tons of steel pipe daily have been the average shipments of two makers for several weeks. The demand for skelp for this class of pipe has been responsible in increasing pig iron output. One company is producing about 1000 tons of pipe daily. Early in the spring the oil country began making heavy calls for large sizes of lap-weld pipe and these have steadily increased in volume. Orders on hand by one maker insure steady operation of pipe mills for three months. The Youngstown Sheet & Tube and Republic Iron & Steel companies, principal local makers, have their tube departments operating at maximum.

More activity is being shown in the demand for sheets and the market is resuming its normal attitude. While buyers evince a tendency to place contracts, provided concessions are made by the producers, few contracts have as yet been closed. The bulk of the business is still of the "spot" variety.

Bar makers report a sustained business which is improving. One producer has orders for 40,000 tons on his books, of which 30,000 are for July delivery.

National Employment Service Discussed

Secretary Wilson Testifies at Length in Regard to Favoring Unions—Bolshevist Faction Defeated at Convention of American Federation of Labor

WASHINGTON, June 24.—Nothing has occurred to clear up the labor situation as far as the Government officials at Washington are concerned. Although Samuel Gompers was re-elected president of the American Federation of Labor at Atlantic City—proof that the Bolshevists are not in control of that organization—enough radical happenings took place there to worry Washington. The fact that President Gompers led a delegation of protesting workers to Washington in a demonstration against prohibition, with threats of further trouble if prohibition were enforced after July 1, has not eased matters. Another cause for worry is the announcement of the American Federation of Labor officials that they intended to "unionize" the steel industry, regardless of consequences. There seems little doubt that they would have the quiet support of the Department of Labor in such an undertaking, although it is not known how far that body will go.

Secretary Wilson's Defense

In the meantime, Secretary of Labor Wilson has devoted two days of testimony before a joint co-session of the Senate and House Committees on Labor to defending the department's Employment Service against charges of favoring unions unduly. This hearing promised to be the climax of the fight which the National Association of Manufacturers has been waging against the various plans to give the war time national employment service a peace standing. The promoters of the service have at various times asked from $4,000,000 to $14,000,000 from Congress to perpetuate this service, but their plan has failed repeatedly. The latest effort was a request for $200,000 to establish a "clearing house" for employment information at Washington. Although this was intended to form only the entering wedge for a larger appropriation, there is considerable question whether either house of Congress will favor a larger grant.

Failed To Obtain Two-Thirds

It is significant that of the 13 suggestions for "industrial relations" submitted to its members by the Chamber of Commerce of the United States, only the one relating to the establishment of a national employment service failed to secure the necessary two-thirds majority. It had more than half the votes, however. The rejected "principle" proposed:

13. A system of national employment offices, with due provision for co-operation with existing State and municipal systems, can be made, under efficient management and if conducted with due regard to the equal interests of employers and employees in its proper administration, a most helpful agency, but only if all appointments are made strictly subject to the civil service law and rules. Policies governing the conduct of a national system of employment offices should be determined in conjunction with advisory boards—national, State and local,—equally representative of employers and employees.

Chamber of Commerce Principles

The "principles" adopted by the members of the chamber to guide their relations to labor, follow:

1. Industrial enterprise, as a source of livelihood for both employer and employee, should be so conducted that due consideration is given to the situation of all persons dependent upon it.

2. The public interest requires adjustment of industrial relations by peaceful methods.

3. Regularity and continuity of employment should be sought to the fullest extent possible and constitute a responsibility resting alike upon employers, wage earners and the public.

4. The right of workers to organize is as clearly recognized as that of any other element or part of the community.

5. Industrial harmony and prosperity will be most effectually promoted by adequate representation of the parties in interest. Existing forms of representation should be carefully studied and availed of in so far as they may be found to have merit and are adaptable to the peculiar conditions in the various industries.

6. Whenever agreements are made with respect to industrial relations, they should be faithfully observed.

7. Such agreements should contain provision for prompt and final interpretation in the event of controversy regarding meaning or application.

8. Wages should be adjusted with due regard to the purchasing power of the wages and to the right of every man to an opportunity to earn a living at fair wages, to reasonable hours of work and working conditions, to a decent home, and to the enjoyment of proper social conditions.

9. Fixing of a basic day as a device for increasing compensation is a subterfuge that should be condemned.

10. Efficient production in conjunction with adequate wages is essential to successful industry. Arbitrary restriction on output below reasonable standards is harmful to the interests of wage earners, employers and the public and should not be permitted. Industry, efficiency and initiative, wherever found, should be encouraged and adequately rewarded, while indolence and indifference should be condemned.

11. Consideration of reduction in wages should not be reached until possibility of reduction of costs in all other directions has been exhausted.

12. Administration of employment and management of labor should be recognized as a distinct and important function of management and accorded its proper responsibility in administrative organization.

The National Association of Manufacturers had filed protests against all of these items, asking that the referendum be withdrawn on the ground that the outline was ambiguous and misleading. This the directors of the national chamber refused to do, merely counting the votes of the protesting members in the negative.

Immigration and Emigration

Both immigration and emigration are figuring in the Washington discussions of labor problems. Union labor opposition to immigration is taking the form of various proposals for increasing the present restrictions, or forbidding immigration entirely for a period of years. Such a solution, it is claimed, would simplify our present difficulties with Japan, which could hardly protest against discrimination, if we barred all immigrants.

On the other side of the ledger stand the figures compiled by the Department of Labor to show that the present year's exodus of alien workers totals 1,300,000, which threatens a serious shortage in many industries that have been dependent upon alien laborers for their recruits. In the milling and coal mining regions alone, the Department of Labor secured information that the following percentages of the following nationalities planned to leave this country:

Austro-Hungarians, 28.2; Poles, 15.04; Russians, 35.70; Croatians, 21.75; Lithuanians, 9.72; Roumanians, 64.20; Italians and Greeks, 11; Serbs, 36.90; and Slovaks, 34.50.

The department estimates that the returning aliens will take with them $4,000,000,000 of American savings.

O. F. S.

More Brass Workers Strike

More than 5000 brass workers, chiefly Russians, Lithuanians and Poles, less than 2 per cent of whom are naturalized, went out on strike in Waterbury, Ansonia and Bridgeport, Conn., and vicinity last week as a result of outside agitators. Though a clear statement of their demands has not been made, it is known that they want a flat increase of 25c. per hr. for all grades of workers, their average wage now being 45c.

per hr.; also overtime increases and abolition of piece work. Walkouts took place at the plants of the Scovill Mfg. Co., the Chase Rolling Mill Co., the Waterbury Rolling Mill Co., the Plume & Atwood Mfg. Co., and the Waterbury, Benedict and Burnham branches of the American Brass Co.

Severe rioting took place, several policemen having been shot, one seriously. Calls were made upon the State Guard, the City Guard and volunteers from among returned soldiers. Firemen first used hoses and later machine guns were used for guarding. Many arrests were made. Mystery exists relative to the organization behind the strikers and to the source of their funds.

Judge Gary on Labor

In an address at Trinity College, Hartford, Conn., June 23, Judge E. H. Gary said in part:

"In considering the relationship between employers and employees the welfare of the latter is of the highest importance, not alone because it is right, though that is reason enough, but also because it is for the benefit of the employers themselves. These groups are associated for mutual profit. They succeed or fail together. Each has obligations and responsibilities. They are not and should not be considered partners in the sense of being entitled to the control of the business in question or to participate in the return on the capital invested, except to the extent of contribution by each to such capital, for otherwise one would share in benefits without sharing in the hazard of investment. Prospective profits furnish the incentive to embark in enterprise and to risk capital. To the extent this is removed or hampered to a corresponding degree will capital be withheld or diverted and economic activity diminished.

"But there are many things the employee is justly entitled to. There is due him fair and reasonable compensation, depending upon all the circumstances surrounding the employment. The times, places, services, and results of operation are important to be considered.

"The workmen ought in some form to be offered opportunity to invest on favorable terms in the business inaugurated by the employer. This encourages thoughtful attention and endeavor to economize and save. It makes the wage earner an actual partner in the business of the concern with which he is associated; a real capitalist. Many of the wage earners have heretofore become property owners, owning the houses in which, with their families, they reside. Some are the holders of interest bearing securities. The number of this character of investors is increasing. They have as keen a desire to see the institutions of this country protected as those who have greater riches, and they may be relied upon to lend their influence and their votes to favor of the protection of property and person. Opportunity must be given to the workmen to increase their pecuniary holdings so far as practicable. To this end I believe the employers will do their part."

Favors Shop Committees

Of the 90 plants which are members of the New York district of the National Metal Trades Association, 88 have experienced no labor troubles, according to a recent statement of Bernard J. Larkin, in charge of the New York headquarters. In discussing recent strikes, he stated that a large percentage of workers walk out because of intimidation, rather than because of their own volition. In a recent strike of workers in a plant employing 300, the management received 80 letters from employees explaining that they did not dare continue at work in spite of their desire so to do.

"The general tendency for workers now is to demand a 44-hr. week at the wages of a 48-hr. week," said Mr. Larkin. "If they receive this they will undoubtedly demand next a five-day week. In one plant the workers, all foreigners, struck for a 44-hr. week and in addition demanded that the company install hot shower baths and allow them the last 15 min. of each day to use them on the company's time. Most of the recent labor trouble has been caused by foreigners who have not been naturalized and who are evidently being stirred up by some force outside their own shops.

"I can see that the shop committees are becoming more powerful," continued Mr. Larkin, "and they are causing a split with the old union leaders." In the shop committees Mr. Larkin sees the solution of the labor problem.

Labor Troubles Check Business in Canada

TORONTO, ONT., June 24.—There has been little change in the volume of buying in the steel market of Canada. The labor difficulties have been an effective check on purchasing on a large scale. Under the circumstances, producers feel that the amount of business is all that could be expected. The improved condition of the United States market is viewed as very encouraging, and there is little doubt felt in the steel trade that this will react very favorably on the Canadian trade as soon as labor difficulties have been settled. The amount of business being placed in the Toronto district at present is not extensive, but the prospects for heavier buying in the near future are viewed as encouraging. The purchasing program of the Canadian National Railways, announced a few days ago, will involve a very large tonnage of steel. The rail requirements of all the railroads of the Dominion will be very heavy, and the prevailing opinion among steel men is that these replacement orders cannot be long delayed.

Labor Cases in Court

Four cases are now pending in the Massachusetts Superior Court, growing out of the strike of the union molders in Worcester. In addition to those of the Reed-Prentice Co. and the Holyoke Machine Works, the Whitcomb-Blaisdell Machine Tool Co. and the Rice, Barton & Fales Machine & Iron Co., manufacturer of paper machinery, have brought bills in equity asking that the strikers be enjoined from picketing the petitioners' premises.

Judge O'Connell has declined to grant a temporary injunction in the cases of the Reed-Prentice Co. and the Holyoke Machine Works, which cases have been heard, and has appointed a master to hear the evidence. Upon his report will be based the court's findings as to a permanent injunction.

In the meanwhile the foundries of Worcester continue to gain in number of men employed, and most of them are melting as much iron as the present business demands.

In the World of Labor

The labor situation in the Connellsville coke region is beginning to present a really acute situation. The past few weeks have seen hundreds of foreigners, principally Italian workers, leaving for their native land. So far there has been little emigration on the part of Slavic workers and if this should come to pass, the labor shortage will be serious. One of the leading independent operators declared last week that the next eight weeks would see a labor shortage of vital importance. All operators have been giving this situation their attention for some time, even as early as the first of the year, when it was realized that a large number of workers of alien birth might seek to return to their native lands immediately upon resumption of transportation facilities.

Youngstown, Ohio, has been established as headquarters of a new district established by the American Federation of Labor, named the Youngstown district. It will have jurisdiction over Federation affairs in Warren, Canton, Massillon, Cleveland, Mansfield and the Mahoning Valley. Heretofore these sections have been governed from the Pittsburgh office.

The molders' strike that affected several foundries at Hamilton, Ohio, nearly five weeks, has now been settled. The wage rate agreed upon is $5.60 for 8½ hr. until Sept. 1, from which date the molders will receive $6 for an 8-hr. day until April 1, 1920.

The patternmaking force of the Chapman Valve Co., Indian Orchard, Mass., struck on June 18 for a wage increase from 75 to 87½ cents per hour and for a 44-hr. week.

American Society of Mechanical Engineers

Departure from Present Society Practices, Increased Research Activity and Discussion of Industrial Relations Features of Last Week's Meeting in Detroit

SEVERAL features marked the Detroit meeting of the American Society of Mechanical Engineers, June 16 to 19, inclusive. Foremost in broad interest was the report of the committee on aims and organization. It took three long sessions to discuss its various recommendations, some of them of a radical nature when considered in terms of existing practices of the society. Industrial relations proved to be acceptably a major subject of interest. A number of addresses partly scheduled and partly extempore interested a large number. Research as a major activity also loomed to the front and out of the two sessions which had to be devoted to this question a comprehensive resolution pointing out paths of assistance in research investigation was passed. There were sessions on other subjects and quite a number of plant visitations of wide appeal. Had it been otherwise there might have been embarrassment in accommodating at meetings the large number registered.

The headquarters were at the Statler Hotel, Detroit, and the registration of both members and guests totaled about 1100. A departure was made in starting on a Monday, and the arrangement was evidently satisfactory in that many of the participants forsook business on the preceding Saturday and joined one of several excursion parties en route. Some gathered in Buffalo on the morning of June 14, spent the day in visiting plants and sights of general interest in Buffalo and Niagara Falls, journeyed by night boat to Cleveland where they were joined by a party which had spent Saturday in that city. Sunday was spent largely on the water on the way to Detroit. The evenings in Detroit were spent in dancing, including a boat ride on Lake St. Clair and the St. Clair River.

The main points in the discussion of aims and organization of the society were covered in the brief report of the meeting on page 1676 of THE IRON AGE of June 19. Amendments to the constitution were presented on the third session devoted to business to provide for the society's adopting standards. It was voted that biographical sketches of candidates for office be sent out with the ballot for election and that the committee on constitution and bylaws be requested to provide for elections so that the declaration of election may be made as early as possible. It was brought out that if the incoming president, for example, has some months to prepare for his duties, more would be accomplished. In consonance with this sentiment, the results of the work of the committee for nominating officers for next year, which work was concluded at the meeting, were announced. The nominations for officers for the year beginning at the close of the annual meeting in early December are as follows:

Nominations for Next Year's Officers

President, Fred J. Miller, recently major, ordnance department, U. S. A.

Vice-Presidents: Prof. R. H. Fernald, University of Pennsylvania, Philadelphia, at present one of the managers; Edward C. Jones, chief engineer gas department Pacific Gas & Electric Co., San Francisco; Prof. John R. Allen, who has resigned as dean of the college of engineering, University of Minnesota, to become director of the bureau of research of the American Society of Heating and Ventilating Engineers at Pittsburgh.

Managers: Prof. Dexter S. Kimball, Sibley College, Cornell University, Ithaca, N. Y.; Earl F. Scott, Earl F. Scott & Co., Inc., Atlanta; Elbert Curtiss Fisher, vice-president and general manager Wickes Boiler Co., Saginaw, Mich.; C. E. Lord, general patent attorney International Harvester Co., Chicago.

Treasurer: William H. Wiley, John Wiley & Sons, New York.

St. Louis is being considered as the place for the semi-annual meeting in 1920.

Research in Malleable Iron

The research sessions were conducted by the society's committee on research, Prof. Arthur M. Greene, Jr., Rensselaer Polytechnic Institute, Troy, N. Y., chairman. One of the notable contributions was a paper on malleable iron research work by Prof. Enrique Touceda, Albany, N. Y. He gave an account of four years of work undertaken for the American Malleable Castings Association as a striking example of what industrial research can accomplish. He told how malleable-iron castings, due to lack of uniformity and dependability, were rapidly being replaced by other materials. There were many fallacious ideas and theories regarding the physical properties of such castings and the methods of annealing them.

Records of tests of 1-in. bars from seven different concerns made by the author in 1911 showed that the average ultimate strength was 39,882 lb. and the elongation under 5 per cent. A report dated March, 1919, to the members of the association, each of whom regularly submits test bars from some one heat of each day's runs, showed that 44 per cent of the test bars submitted during that month had an ultimate strength over 52,000 lb. and an elongation of 14.67 per cent, indicating the progress made since research work was undertaken.

Professor Touceda further stated that the average of test bars of the association from Jan. 1, 1917, to March 31, 1919, has shown an ultimate strength of 51,000 lb. and an elongation 12.5 per cent. The records of tests show, contrary to generally accepted theory, that the elongation increases with the ultimate strength. The purpose of the association, however, is not to increase ultimate strength and elongation but to increase the uniformity of a product upon which the engineer can rely, and this is being accomplished through exhaustive research and advice to members through the consulting engineer of the association.

Research Activities

Professor Greene presented a monograph on "The Present Condition of Research in the United States" and among the addresses was one by Dr. Mees, Eastman Kodak Co., Rochester, N. Y. He put the first cost of an industrial research laboratory at $3,000 to $5,000 per man employed and the operating expenses at the same figure. Of the latter 60 per cent go for wages.

The resolution voted by the research session provided for nation-wide support of research, financial and otherwise. It was presented on the initiative of the research committee of the Chicago section and follows:

That Engineering Council shall be encouraged to undertake active support of a plan and organization of scientific and industrial research, to the end that the following objects may be accomplished with all reasonable dispatch.

1. To secure the passage in the present Congress of a special act furthering nation-wide research in State units through Congressional appropriations for this purpose under the general co-ordination of Engineering Council or other national agency thoroughly representative of the engineering proposition.

2. To encourage trade, industrial and utility associations to interest themselves in the advance of the arts and the constructive benefits to be derived from research work in their respective fields and to co-operate with them in their efforts in these directions.

3. To encourage the various research institutions or instrumentalities now or to be established by the Federal and State governments in their close co-operations in this general research policy.

4. To encourage and assist in the establishment of organ-

ized departments of engineering research at the various universities, adequately equipped with material and personnel and to bring such department as closely as possible in touch with the vital problems of industrial development confronting the nation.

5. To institute organized publicity with the industries of the country and ascertain broadly by a thorough canvass their vital needs, with a view to directing the research work of the country and the co-operative development of the industries through the agency of the technical laboratories both public and private.

6. To organize and support a separate department of the society's activities, in close co-operation with similar departments of other technical societies, to act, through Engineering Council or other representative national agency, as a permanent clearing house for all research work.

Industrial Relations

The industrial relations session was opened by an address by Arthur H. Young, until a few months ago director of the American Museum of Safety in New York and now in charge of industrial relations for the International Harvester Co. Following this L. P. Alford, for the committee on meetings and program, presented a report outlining the important transitions which have occurred in the field of labor and employment from the time of the Civil War and "including the situation which now exists, so similar in character, but greatly amplified." Quite a general discussion followed.

Mr. Young, by way of introduction, spoke of the inception of works safety development at the hands of R. J. Young, of the South Works of the Illinois Steel Co. in 1906. For three years there was only a 20 per cent reduction from the former accident records and it was recognized that mechanical safeguards and contrivances were not all sufficient but there was a psychological side. Since then there has been an increasing use of motion pictures, bulletin boards, mass meetings, public safety councils, etc., with the idea finally promulgated in the schools. The result is shown in not more than 6 or 7 fatalities yearly against 46 in 1906. So also has there been no less than 85 per cent less serious accidents.

One of the by-products of the safety movement has been the growth of the industrial relations movement. It was not merely humanitarian, Mr. Young emphasized, but a paying matter. The accident rate of the Steel Corporation in 1906, for example, multiplied by the number of men employed now, thus to estimate the likely number of accidents yearly at this time, and this product multiplied by the cost of an accident gives the amount of money which might have been paid out for accidents of the industry. Instead the actual amount paid out left a remainder which was no more than the cost of the safety work, equipment, etc. The formation of shop committees with workmen in charge of investigations, recommendations and inspections had its effect in a reduced labor turnover.

The speaker then told of the Harvester Industrial Council covering a system of collective bargaining. From 19 different plants of the company, 148 representatives were chosen on March 12 when the plan was offered to the employees. Of these 127 were married and 21 were single. The average length of service in the company was 7 years, 7 months. Of the total 102 were native born and 46 of foreign birth, but naturalized. Ninety-seven per cent of the employees took part in the voting for and against the plan, and the critical selection of candidates was evidenced by the fact that the winning candidates got 68 per cent of the votes. The company operates on the open-shop plan but many of the 148 representatives are union men, and, said Mr. Young, they are the best ones. "If they were chosen as antagonists of the plan, they are no longer so. About the first thing demanded was an 8-hr. day and higher wages than obtained at 9-hr working on the 8-hr. basic day. It was withdrawn when the management showed the time not opportune, having in mind the market conditions affecting costs and prices of agricultural machinery. Indeed, the men were satisfied with a cut to the 8-hr. operation. The men pledged to give the same output as for 10 hr. They pointed out there was not complete efficiency in that men were slow on arrival and often wasted half an hour before getting down on a job.

He emphasized the efforts being constantly made to establish a soviet form of government and much racial feeling is injected into the controversies. Of 22 per cent of the employees who went into the war, however, 20.2 per cent were foreigners. Anti-foreign sentiment was directed especially against the Polish, though they numbered 33 per cent of the foreigners in the war. The true situation was ascertained by the men and not by the management. In bulletins shop parlance holds sway as a result of the active part taken by the workmen. And one notable result is that no wages or grievance committee has been found necessary.

Fred J. Miller in the discussion urged that the industrial relation must be a business relation between employer and employee one that is mutually and therefore permanently satisfactory. Others who took part were Dr. Otto P. Geier, Cincinnati Milling Machine Co.; Capt. Boyd Fisher, now in consulting management work; L. W. Wallace, Red Cross Institute, Baltimore; and S. H. Libby, Sprague Electric Works, Bloomfield, N. J.

Inspectors to Hold Exposition and Convention

The first annual mechanical inspection equipment exposition and convention of the American Society of Mechanical Inspectors will be held at the Hotel Astor roof garden, New York, Feb. 2 to 6, 1920, inclusive, according to preliminary plans just announced. The invitation is being extended to all manufacturers of inspection and tool room equipment throughout the United States to participate by reserving booths for the display of their products. The exposition will be both commercial and educational, giving the maker a chance to advertise his product, and teaching the inspector the latest appliances and how to use them. Officers will be elected for the year and important plans will be developed. The first evening will be devoted to a dinner. The exposition will be open both days and evenings. Music will be furnished each night by bands from industrial plants, no band playing more than one evening. Arrangements are in charge of Henry F. Winter, managing editor *The Inspector*, the publication of the society, 35 West Thirty-ninth Street, New York.

Canadian Industrial Congress in August

Western Canada is to have an industrial congress at Calgary, Alberto, Aug. 11-16, to which manufacturers and industrial leaders of the continent as well as those of the United Kingdom are being invited. The purpose of the congress is educational to a large extent along industrial lines, though one of the avowed intentions is to promote and increase the friendly relationship between the United States and Canada.

Subjects scheduled for discussion are: Western markets, Western industry, Pacific trade and transportation routes, Oriental commerce, the future alignment as between East and West in so far as manufacturing is concerned, and the great question of building up the Pacific regions and the adjacent inland territory.

Headquarters have been established at the Palliser Hotel, Calgary.

Pittsburgh Foundrymen's Association

The June meeting of the Pittsburgh Foundrymen's Association was held last week at The Pines, a summer resort near that city. Baseball and other athletic events took place in the afternoon, and after dinner in the evening the annual election of officers was held. Andrew Fulton, Fort Pitt Malleable Iron Co., McKees Rocks, Pa., was chosen president for the ensuing year; A. J. Hartman, United Engineering & Foundry Co., vice-president; William J. Brant, William J. Brant Co., treasurer; Bayard Phillips, Phillips & McLaren Co., secretary. The directors are J. Lloyd Uhler, Union Steel Casting Co.; J. S. McCormick, J. S. McCormick Co.; Henry Spilker, Sterritt-Thomas Foundry Co.; Clarence E. Williams, Allen S. Davison Co., and Carl Koch, Fort Pitt Steel Co.

Iron and Steel Markets

IMPROVEMENT MAINTAINED

Wire Products Strong and Coke Higher

Bookings Accumulating—Advances in England, Including Labor—Pig Iron Sold Abroad

Production is now at about 60 per cent of ingot capacity, and June's output will probably be fully 10 per cent more than May's. The greater activity in pipe, wire and sheets is offset by the still relatively small demand for bars, plates and shapes. Orders are coming in faster than the shipment rate, and some accumulation of bookings is the tangible evidence of the continued improvement.

The old law of supply and demand is receiving some recognition. Buying of wire and wire products and of iron and steel pipe remains sufficiently vigorous so that talk persists of an early advance. It happens, however, that the strong hands among producers are opposed to a price change, at least for several months, but one mill demands $2 more per ton on wire and 25c. more per keg on nails for export.

Three large makers of lap-weld pipe are booked practically for the remainder of the year, and the revival in building accounts in part for increased interest in butt-weld pipe. With mills at a 75 per cent operating basis there is less shading in sheets.

The upward price movement in England is marked, particularly in rails, which are now quoted at $73.60, against $45 here. Wages have there been increased 12½ per cent, and mill operatives now demand the 6-hr. day.

Germany has begun taking steel business in neutral markets at prices which England cannot consider, and Belgium is offering bars, plates and shapes at Antwerp, though probably not in very large amounts, equal to and in some cases a little below British seaboard prices. Luxemburg plants expect to be in full blast in two months, marketing through Antwerp.

American pig iron is reported sold at $3.45 below the British product. American billets were bought at $58 per ton, Liverpool, for July shipment.

Italy is looking forward to getting some of the great quantities of scrap in France, Germany and Austria, and wants Westphalian coke, the American product not apparently being regarded favorably in comparison even with English coke.

Structural steel lettings continue to grow, and the East is now beginning to get the pace of the Central West. The June total will exceed the figures for May, which at 88,000 tons were double the business taken in April.

Pig-iron activity is mainly in foundry and malleable grades. Sales of 7000 and 8000-ton lots are reported from Cleveland. Inquiry which is not considered has come for contracts for the first half of next year.

Ferromanganese producers, after facing for some few months low-priced offerings of resale material, last week reduced quotations from $125 to $110 a ton. After selling several thousand tons, the price went back to $125, and less is now feared of British ferromanganese, offered at $121, Atlantic seaboard.

Offerings of shell steel by the Government as scrap are bringing out comparatively high bids. On 8000 tons held at Orange, Mass., $16.27, shipping point, was the high bid, and on 5000 tons at Morgan, N. J., a Pittsburgh scrap dealer bid $17.41, shipping point.

The Government in the Chicago district sold 1450 tons of 3¼-in. rounds for rerolling purposes at a reported price of $28.50 per ton.

Based on the cost factor, Chicago bar iron mills have brought prices to a parity with steel bars, raising the ton price $2.40.

A manufacturer in the Chicago district was unable to consider an inquiry for 2,000,000 bolts from an automobile builder because prompt delivery could not be made.

Unless shipbuilding and locomotive and car building soon show considerable expansion there will undoubtedly be idle plate capacity. Cuba has bought 500 and Chile is in the market for 600 cars.

Large sales of coke for last-half delivery have been made in the Pittsburgh district, and prices are stiffer, with foundry coke 25c. higher.

Pittsburgh

PITTSBURGH, June 24—(*By Wire*).

There are no signs of any abatement in the better demand for finished steel products, and the firmness in prices still remains, with more talk in the trade of coming early advances on some lines of finished steel, notably wire and wire nails, and possibly on iron and steel pipe. These two products are in very heavy demand, mills are well sold up for some months, and a higher market in the near future on both is expected. In fact, one local interest has advanced wire $2 a ton for export, and nails 25c. per keg for export, and this is said to be only preparatory to a general advance in wire prices in the near future. The higher rate of operation among the steel and finishing mills is keeping up, but possibly may show a slight sag during the hot weather in July and August. The sheet and tin plate mills have materially improved their rate of operation in the past week. There is no longer any thought of lower prices in the trade, and this was shown by the fact that a good many consumers and jobbers are willing to cover for third quarter and in some cases for last half of the year. Mail orders received and sent to the mills, also specifications, so far this month have shown an increase over May, but what will happen in July and August is a question. Conditions seem to be shaping themselves for an active iron and steel market in the latter part of the year, probably to start early in September. Some in the trade are predicting an 80 to 90 per cent operation by the steel mills to come in

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 24, 1919	June 17, 1919	May 27, 1919	June 25, 1918
No. 2 X, Philadelphia‡	$29.50	$29.50	$29.50	$34.40
No. 2, Valley furnace†	26.75	26.75	26.75	33.00
No. 2 Southern, Cincin.†	28.35	28.35	29.35	36.60
No. 2, Birmingham, Ala.†	24.75	24.75	26.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, deliv., eastern Pa.	25.50	25.50	29.65	32.90
Basic, Valley furnace	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh	29.35	29.35	29.35	36.60
Malleable, Chicago*	27.25	27.25	27.25	33.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh	27.15	27.15	27.15	33.40
L. S. charcoal, Chicago	38.85	38.85	38.85	37.85
Rails, Billets, Etc.,				
Per Gross Ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh	42.00	42.00	42.00	51.00
Forging billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Philadelphia	42.50	42.50	42.50	51.30
Wire rods, Pittsburgh	52.00	52.00	52.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.595	2.595	2.595	3.73
Iron bars, Pittsburgh	2.35	2.35	2.35	3.50
Iron bars, Chicago	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, New York	2.62	2.62	2.62	3.145
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.495
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.245
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	June 24, 1919	June 17, 1919	May 27, 1919	June 25, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh	4.25	4.25	4.25	4.00
Fence wire, base, P'gh	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh	4.10	4.10	4.10	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$22.50	$22.50	$20.50	$29.00
Carwheels, Philadelphia	23.00	23.00	20.00	29.00
Heavy steel scrap, P'gh.	17.50	17.50	15.50	29.00
Heavy steel scrap, Phila.	17.00	16.00	15.00	29.00
Heavy steel scrap, Ch'go.	17.00	17.00	15.50	29.00
No. 1 cast, Pittsburgh	19.00	19.00	17.00	29.00
No. 1 cast, Philadelphia	22.00	22.00	21.50	29.00
No. 1 cast, Ch'go, net ton	21.00	21.00	19.50	27.50
No. 1 RR. wrot., Phila.	22.00	22.00	21.00	34.00
No. 1 RR. wrot., Ch'go, net	17.00	17.00	15.75	29.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$4.00	$6.00
Furnace coke, future	4.00	4.00	4.00	6.00
Foundry coke, prompt	4.75	4.50	4.50	7.00
Foundry coke, future	5.00	5.00	5.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	18.50	18.25	16.75	23.50
Electrolytic copper, N. Y.	18.25	18.00	16.50	23.50
Spelter, St. Louis	7.00	6.50	6.25	8.37½
Spelter, New York	7.35	6.85	6.60	8.62½
Lead, St. Louis	5.15	5.10	5.00	7.75
Lead, New York	5.40	5.35	5.25	7.82½
Tin, New York	70.00	72.50	72.50	92.00
Antimony (Asiatic), N. Y.	8.37½	8.37½	8.25	13.00
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.75

September, or very early in October. Steel mills in the Youngstown, Ohio, district are now very close to a 75 per cent operation, the best for some months. In the Pittsburgh district operations are on at least a 75 per cent basis, with several of the larger steel concerns operating at close to 80 per cent. There is less cutting in prices now than at any time since the betterment in the steel trade started.

Pig Iron.—There is very little activity in steel-making iron, but there is considerable in foundry and malleable. Some merchant furnaces making foundry iron are pretty well filled up over third quarter, and have a fair tonnage sold for last quarter. The American Steel Foundries has an inquiry out for 2000 to 3000 tons of basic iron for its Alliance, Ohio, plant. There is some export inquiry for Bessemer iron, three or four fair-sized lots being under negotiation. Prices on pig iron are firmer, and resale iron has been pretty well cleaned up. We quote as follows:

Basic pig iron, $25.75; Bessemer, $27.95; gray forge, $25.75; No. 2 foundry, $26.75; No. 3 foundry, $26.25, and malleable, $27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Billets and Sheet Bars.—There is an active export inquiry for billets and slabs, and some fair-sized business has been closed. There is no domestic inquiry for billets or sheet bars, but consumers like the sheet and tin plate mills are taking out more steel than for some time. Forming billets are fairly active and sales of 700 to 800 tons are reported at the full regular price.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38.50, 2 x 2 in. billets at $42; sheet bars, $42; slabs, $41, and forging billets, $51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Last week several of the larger sellers and producers of domestic ferromanganese made wire offers freely of 78 to 82 per cent of domestic ferromanganese at $110 delivered, so that this can be considered the market price. The Brier Hill Steel Co. has an inquiry out for 1200 tons of ferromanganese, 300 tons a month for last four months of this year. We note sales of two cars, 60 to 70 tons, of 50 per cent ferrosilicon at $80 per gross ton delivered, and this price seems to be the market on this material.

We quote 78 to 82 per cent resale ferromanganese at $110 delivered, with a reduction of about $2 per unit for lower percentages. We quote domestic ferrosilicon at $80 and 18 to 22 per cent spiegeleisen at $33 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $47.75; 10 per cent, $49.75; 11 per cent, $53.05; 12 per cent, $56.35. We quote 6 per cent silvery iron, $36.75; 7 per cent, $38.50; 8 per cent, $40.25; 9 per cent, $42.25, and 10 per cent, $44.75. About $3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—There is no betterment in demand for plates and nothing in sight at the moment that would seem to warrant the belief that a heavier demand will come in the near future. No orders for cars are being placed. The steel car shops are doing very little and taking out very few plates. The mills are not operating to more than 50 per cent of normal capacity on the average and have very little work ahead. Prices are holding firmly, but are sometimes shaded $2 to $3 per ton by a few mills. We quote ¼-in. and heavier tank plates at 2.65c. at mill, Pittsburgh.

Structural Material.—The past week has been light in inquiry, but a good deal of work is in sight and is expected to develop in the next week or two. The Fort Pitt Bridge Works has taken about 2000 tons of bridge work in Chicago, the McClintic-Marshall Co. about 1000 tons for new sheet mill buildings for the Newton Steel Co., Newton Falls, Ohio, and the Jones & Laughlin Steel Co. 500 tons for a steel building for the Edison Electrical Appliance Co., Chicago. It is said prices are holding firmly.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

Sheets.—Mills report the demand for electrical sheets, highly finished sheets for automobiles, and also

for black plate for tinning, galvanizing or enameling is steadily getting better, and the demand for black and galvanized sheets is also showing some betterment. This week the American Sheet & Tin Plate Co. is operating its hot sheet mills to about 75 per cent of capacity, and the independent mills are doing the same. Orders entered by the American Sheet & Tin Plate Co. for sheets so far this month represent full normal capacity, and this concern is now four to six weeks back in deliveries on some grades. The export demand for sheets is heavy and regular shipments are being made to South America, India and the Far East. There is said to be some cutting in prices on black and galvanized sheets, but this does not amount to more than $2 to $3 a ton and is being done by only three or four mills. It is stated the mills that have been cutting prices on sheets are now well filled and operating to about 100 per cent, so that cutting in prices is expected to disappear in a short time. Prices on sheets, effective from March 21, and which are being shaded $2 to $3 on black and galvanized in some cases are given on page 1747.

Tin Plate.—The rate of operation among the tin plate mills is getting larger. The American Sheet & Tin Plate Co. is operating this week to about 65 per cent of hot tin mill capacity. This company will start, about July 1, some of the 24 new hot tin mills it is building at Gary, Ind. This new plant will contain 12 double mills, or 24 single mills, which with the present plant of 24 single mills, will give it a total of 48 single tin mills, making it the largest individual tin plant unit in the country. All of the 24 mills are expected to be in operation in the early fall. More orders are being placed for tin plate than for a long time, and specifications on contracts are coming in very freely. There is some export inquiry, one interest taking an order the other day for 21,000 boxes for export. Prices are holding very firmly, but are sometimes shaded about 25c. per box on production plate by a few mills. The demand for terne plate continues heavy. We quote production tin plate at $7 per base box, f.o.b. Pittsburgh. Stock items are fairly active and are still being shaded in price 50c. to 75c. per box. Prices on terne plate, effective from March 21, which are said to be holding very firmly, are given on page 1747.

Iron and Steel Bars.—Local mills report the demand for steel bars as heavy, and a few implement makers and other large concerns have covered their needs for third quarter and last half of this year. Youngstown, Ohio, mills rolling steel bars report their trade very active. The demand for reinforcing steel bars is much heavier than some time ago, and mills making reinforcing bars from sheet steel discards are now quoting practically the same price as on bars rolled from billets, which is 2.35c., Pittsburgh. The Carnegie Steel Co. has taken about 3000 tons of steel bars for the North Hill Viaduct at Akron, Ohio, and the Lackawanna Bridge Co. has taken 500 tons of sheet piling to be used in the building of the Government dam over the Ohio River. The demand for iron bars is also more active, and a local mill that is turning out about 300 tons per day is shipping this product about as fast as made. Prices on both iron and steel bars are firm.

We quote steel bars, rolled from billets, at 2.35c., and from old steel rails 2.45c. Eastern mills are quoting iron bars for eastern shipment at 2.35c., while for western shipment 2.55c., Pittsburgh, is quoted. Pittsburgh mills rolling iron bars quote at 2.75c., Pittsburgh, plus full freight rate to point of delivery.

Wire Products.—The heavy demand for wire and wire nails which has been in evidence for a month or more seems to be getting larger, and several local makers report that new orders and mail specifications, so far in June, have been heavier than in the same period in May. One local interest has so much wire business on its books that it has advanced its prices on export wire $2 per ton and on wire nails 25c. per keg, or $5 per ton. Local mills are operating their wire departments at 80 per cent or better, and say they have enough business to run 100 per cent, if certain conditions permitted them to do so. Some mills are booked four to six weeks in shipments on wire and the export demand continues heavy. Large shipments of wire products are being made by local mills to South America, India and the Far East, at full domestic prices. The wire market is very firm, but there is still some slight shading in prices on coated nails, mostly by Western shippers. Several local mills say they are holding coated nails firm at the regular prices. Prices on wire products, as adopted on March 21, are given on page 1747.

Wire Rods.—Two local makers, which sell their surplus rods in the open market, say they have all the business on their books they care to have for shipment up to October. Both the domestic and export demand is active, and recently inquiry for chain rods has been heavier. As the chain makers are getting more business, and using more rods, it is said regular prices, as adopted March 21, are being firmly held, and these are given on page 1747.

Cotton Ties.—The season has opened and the price of cotton ties has been made $1.70 per bundle of 45 lb. at mill, Pittsburgh, for June shipment, and starting with July there is an advance of 1½c. per bundle for each successive month. The new price is 20c. less per bundle than last year, but the carrying charge this year is 1½c. per bundle per month, as against 1c. last year. Some time ago the cotton crop this year was estimated to be 13,000,000 bales, but now it is believed it will hardly reach that quantity. Practically all large buyers of cotton ties have been covered by the mills for their season requirements, and the mills have been accumulating stocks of cotton ties for some months, in order to make desired shipments to their trade.

Hot-Rolled Strip Steel.—Several local makers report that while the demand is a little better it is still very far from being satisfactory. A few consumers have covered for third quarter, but buying is mostly in small lots for current needs and prompt shipment. We quote hot-rolled strip steel at 3.05c. to 3.30c. per lb., f.o.b. mill, Pittsburgh. Some consumers are paying the latter price for hot-rolled strips for drawing and deep stamping purposes.

Cold-Rolled Strip Steel.—The demand is fairly good, some consumers having covered for third quarter, and jobbers are buying more freely. Prices are being shaded to some extent, but are firmer than for some time.

We quote cold-rolled strip steel at $5.65 base per 100 lb., f.o.b. Pittsburgh, for 1½ in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Hoops and Bands.—There seems to be no doubt that the prohibition expected to come July 1 has restricted very much the demand for hoops and bands, which the mills report as light and only for small lots for prompt shipment. It is said the regular price on hoops and bands of 3.05c., Pittsburgh, plus usual extras, is being firmly held.

Shafting and Screw Stock.—Jobbers have evidently decided that prices on shafting will hold, as makers report they are placing orders freely for stock. There is also a heavy demand from automobile builders and from the screw stock people who build automobile parts. The present demand for shafting is only about 40 per cent of capacity. We quote cold-rolled shafting at 28 per cent off, in carloads, and 23 per cent in less than carloads, f.o.b. Pittsburgh. A few makers are slightly shading these discounts, usually by allowing all or a part of the freight to delivery point.

Nuts and Bolts.—Makers report the demand much heavier from consumers, and also say that jobbers are now feeling out the market and are making offers for nuts and bolts much below what the consumer will accept. Prices are higher than they were a month or two ago, and some makers say that if the demand continues to get much heavier there will have to be an advance in prices on nuts and bolts. Discounts, as adopted March 28, which are now said to be firmly held, being slightly shaded only in some cases, are given on page 1747.

Spikes.—Inquiry for rail and boat spikes is quiet, the only active inquiry in the market being one from

the Baltimore & Ohio Railroad, for 5200 kegs for prompt shipment, on which the makers have quoted prices as adopted March 21 last, and which are said to be holding firmly, in spite of the very small amount of new business being placed.

We quote standard spikes, 9/16 x 4½ in., and also small spikes, $3.35 base per 100 lb. in carload lots of 200 kegs or more plus usual extras. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more.

Boiler Tubes.—The demand for locomotive tubes is reported a little better, but for merchant tubes is light. Mills rolling iron and steel tubes are not operating these departments to more than about 50 per cent of normal capacity. Discounts on iron and steel tubes, as adopted March 21, are given on page 1747.

Iron and Steel Pipe.—Several large inquiries for line pipe are in the market, but two or three mills say they are filled up so far ahead on lap-weld and oil country goods that they are not very anxious to take on more contracts, fearing they will not be able to make the delivery wanted. On lap-weld and oil country goods, three of the larger mills are practically filled for the remainder of this year. The demand for butt-weld pipe is much heavier now than for some months, both jobbers and plumbing supply houses buying freely. The export demand for pipe continues heavy. Mills are now operating at from 85 to 90 per cent of capacity, and are filled up for some months. Prices on line pipe are now very strong, and it is said recent cutting has about disappeared. Discounts on iron and steel pipe, effective from March 21, are given on page 1747.

Coke.—A heavy business in blast furnace and foundry coke for last half of the year delivery has been closed in the past week. Prices ranged from $4 a ton flat on furnace coke up to $5.25 on best grades of 72-hr. foundry coke. However, most contracts closed for furnace coke were on a sliding scale basis. One contract is for 8000 tons a month on the basis of 6¼ tons of coke to a ton of basic iron, this being $4.12 for the coke on the present price of $25.75 for basic iron at Valley furnace, this contract having a minimum price of $4 and a maximum price of $8 per ton attached to it. One Buffalo furnace interest has bought 8000 tons of furnace coke per month over last half of the year at $4 per net ton flat at oven. Several other large contracts, one for 8000 tons a month, and another for 12,000 tons per month of furnace coke, have been closed on the basis of 6¼ tons of coke for a ton of basic iron. Still another contract for furnace coke for 10,000 tons per month for last half of the year has been closed on the same basis, but ore is given in payment at market prices for the coke, so that this transaction is really an exchange of coke for ore. A local interest closed in the past week upward of 40,000 tons of 72-hr. foundry coke for last half of the year delivery at $5 to $5.25 per net ton at oven. Prices on spot coke are firmer, as the supply has been pretty well cleaned up, and it has sold at $4.25 per net ton at oven. We now quote best grades of blast furnace coke at $4 to $4.25, most producers asking the higher price. We quote 72-hr. foundry coke of best grades at $4.75 to $5 at oven for prompt shipment, and $5 to $5.25 on contracts for last half of the year. The Brier Hill Steel Co., Youngstown, Ohio, has an inquiry out for 12,000 tons of furnace coke per month for last quarter delivery, and the Reading Iron Co., Reading, Pa., has a heavy inquiry out for blast furnace coke. The output of coke in the Upper and Lower Connellsville regions last week was 127,095 tons, an increase over the previous week of 9440 tons.

Old Material.—Prices on steel-making scrap are very firm and some dealers are quoting $18 and as high as $18.50, but we do not hear of any sales at the latter figure, while two or three small sales are reported at $18, delivered. The Government is selling scrap in this district more freely than for some time. Two large lots of shell blanks have been sold to local dealers, one at $17.55 and the other at $18 at point of shipment. This will probably be resold to consumers as a lower grade of low phosphorus scrap. The market generally is quiet, aside from heavy steel melting scrap, for which there is still an active demand, and prices are very firm. We quote for delivery to Pittsburgh consuming points and other points that take Pittsburgh freights, in gross tons, as follows:

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$17.50 to $18.00
No. 1 cast, for steel plants	19.00 to 19.50
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	19.00 to 20.00
Compressed steel	14.50 to 15.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	13.50 to 14.00
Bundled sheet stamping	12.00 to 12.50
No. 1 busheling	14.50 to 15.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	23.00 to 24.00
Iron car axles	29.00 to 30.00
Locomotive axles, steel	29.00 to 30.00
Steel car axles	26.00 to 27.00
Railroad malleable	16.00 to 16.50
Machine shop turnings	9.50 to 10.00
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	19.00 to 20.00
Sheet bar crop ends (at origin)	19.00 to 19.50
Heavy steel axle turnings	13.50 to 14.00
Heavy breakable casts	19.50 to 20.00
Cast iron borings	11.25 to 11.50
No. 1 railroad wrought	19.50 to 20.00

Coke Production Gains

WASHINGTON, June 24—The production of beehive coke in the week ended June 14 is estimated by the Geological Survey at 297,500 net tons, compared with 271,400 tons in the week ended June 7, a gain of about 26,000 tons, or more than 9 per cent. Although the production of beehive coke has been slowly but steadily increasing in recent weeks, at the present rate of production it is less than 45 per cent of that for the first half of June last year. The shipments of lake coal continue to exceed the million-ton rate per week.

New Steel Mill for Kansas City, Mo.

The Black Steel & Wire Co., Kansas City, Harry W. Black, president, has completed plans to build a new steel plant at its wire rope mill. This plant will consist of two furnaces for making steel ingots, together with electrically-driven rolling mills and attendant machinery for the manufacture of steel ingots and rolling into wire rod bars and shapes. The plant will have a capacity of 100 tons a day. W. E. Moore & Co., engineers, Pittsburgh, have charge of construction.

Wickwire Stacks Enlarged

The Wickwire Steel Co. is increasing the hearth diameter of its X and Y furnaces at Buffalo so that the combined capacity of the two stacks will be from 25,000 to 27,000 tons of pig iron per month, as compared with their former capacity of 22,000 to 24,000 tons. It is expected that the stacks will go in blast in July.

The stock of the Belcher Malleable Iron Co., Easton, Mass., has changed hands and the plant will be operated under new management. The officers of the new corporation are R. P. Rowe, president, and C. B. Swasey, treasurer.

The Industrial Electric Furnace Co., 53 West Jackson Boulevard, Chicago, now owns all patents covering the Snyder electric furnace, F. T. Snyder, formerly vice-president, having left the organization, effective June 1.

Bids are being received by the Falcon Steel Co., Niles, Ohio, for its new plant. The company has established temporary offices in the building occupied by the Niles postoffice. Lloyd Booth is president.

Chicago

CHICAGO, June 24.

The general situation is steadily improving, although some finished products, such as plates and bar iron, are dull. The signing of the peace treaty is expected to release a considerable amount of export business which has been held in abeyance. There is an increased demand for contracts on the heavier materials. The volume of wire and bolt and nut business continues to expand and price advances are expected. Mill operation continues about the same, but undoubtedly it would have shown improvement had not the heat impeded the work of the men, particularly in the sheet mills. Active buying of foundry and malleable iron continues. Scrap is increasing in strength as the result of speculative buying by dealers.

Pig Iron.—General buying of foundry and malleable continues. Not only are melters contracting for last-half requirements, but they are placing numerous orders for immediate shipment. While many orders are for round tonnages, consumers are nevertheless rather conservative in their purchases. A particularly encouraging feature is the fact that agricultural implement manufacturers are commencing to buy. Southern furnaces are steadily dropping out of the market. It is believed that only one Southern producer is still absorbing freight to Chicago on foundry grades, and it is doing so only for third-quarter delivery on iron running higher than 2.75 per cent silicon. It is reported that Buffalo furnaces are assuming the freight on foundry iron to certain Michigan and Indiana points. Considerable charcoal iron is being sold for last-half delivery.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon, 1.50 second half delivery, f.o.b. furnace, average freight to Chicago $2.50 (other grades subject to usual differentials)	$29.25
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	29.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75 (nominal)	33.00
Southern foundry, silicon, 1.75 to 2.25 (nominal)	31.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	40.00
Silvery, 7 per cent	42.05

Ferroalloys.—Ferromanganese weakened recently and for a time was quoted at $110, delivered, but has since advanced to $125 again. Spiegeleisen has shown some strength and is now quoted at $35, furnace. Resale stocks of Bessemer ferrosilicon have disappeared. Ferrosilicon, 50 per cent, continues inactive.

We quote 80 per cent ferromanganese at $125, delivered; 50 per cent ferrosilicon, resale, at $110, delivered; spiegeleisen, 18 to 22 per cent, $35, furnace.

Structural Material.—The Duffin Iron Works, Chicago, will fabricate 2000 tons, to be furnished by the leading independent, for the Webster Hotel, Chicago. The Wisconsin Bridge & Iron Works has been awarded 490 tons for a power house for Armour & Co. at Kansas City, Kan. The George D. Whitcomb Co., Rochelle, Ill., has divided 115 tons for locomotive cab frames between the Illinois Steel Co. and another local interest. Lanquist & Illsley, Chicago, have been awarded the general contract for the Northwestern Telephone Building, Minneapolis, involving 2500 tons of steel. The general contract for the Dallas, Texas, Federal Reserve Bank, requiring 700 tons, has been awarded to the George A. Fuller Co., Chicago. The Chicago & Northwestern is inquiring for 350 tons for an elevator. The Mead-Morrison Mfg. Co. has asked for bids on 145 tons for an unloading tower to be built at Pittsburgh. Plans are being prepared for a bascule bridge at North Avenue, Milwaukee, which will require about 300 tons. The International Harvester Co., Chicago, has taken bids on 275 tons for its Deering plant, and Manitowoc, Wis., has received bids on 250 tons for a bascule bridge. The Edison Electric Appliance Co., Chicago, has not yet awarded the 500 tons on which it recently received bids.

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Bars.—Two mills in this district are reported to have raised the price of bar iron to 2.62c., Chicago. This action was taken because it costs more than 2½c. to make base size products under present operating conditions. There is little demand for iron bars because the railroads, which are the principal consumers, are buying from hand to mouth. There is a fairly good demand for mild steel bars coming from miscellaneous sources and rail-carbon business is improving gradually. A local rail-carbon mill which has been operating single turn for a protracted period expects to go on double turn in about two weeks. The demand for both mild steel and rail-carbon steel bars for reinforcing purposes is fair. Agricultural implement manufacturers have not yet commenced to buy except in small quantities.

Mill prices are: Mild steel bars, 2.35c. Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50c. to 2.62c. Chicago, rail carbon, 2.45c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Plates.—Business is fair but not on a par with other finished steel products. The absence of extensive railroad buying and the cessation of purchases by the shipyards are important reasons for the relatively small amount of work now on the books of the mills. Export inquiry, however, is improving, although difficulty is being experienced in arranging for all the necessary papers to finally close the orders. The signing of the peace treaty with its stabilizing effect on international credit relations is expected to release considerable foreign business, including a large tonnage of plates, shapes and bars for Japanese ship construction. Perhaps the heaviest demand for plates at present is from the oil fields. The Atlantic Coast Line is inquiring for 100 freight cars and the Chilean Government is in the market for 600 cars.

The mill quotation is 2.65c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Sheets.—Weakness in sheets is fast disappearing. Mill operation of late has been impeded by the hot weather, in the case of one interest reducing output about 25 per cent. One maker has business on its books sufficient to insure operation during the next three months. The export demand is improving. There is an increasing disposition on the part of foreign buyers to pay the market prices. Those mills which were willing to make concessions on immediate shipments a few weeks ago are no longer inclined to do so.

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c., and No. 28 galvanized, 6.72c.

Wire Products.—The demand continues good. Buyers are specifying in larger amounts to build up their stocks and are asking for contracts to cover their future requirements. At least one company has advanced the price of wire for export $2 per ton and nails for export have been marked up 25c. per keg. For mill prices, see finished iron and steel f.o.b. Pittsburgh, page 1747.

Bolts and Nuts.—The demand from the automobile industry continues good and purchases by other interests are for generous amounts. One mill in this district and two in Pittsburgh are operating at 100 per cent of capacity and others are on a healthy basis. One manufacturer was forced to turn down an inquiry for 2,000,000 bolts from an automobile concern because prompt delivery can not be made. Jobbers are specifying heavily to replenish stocks and buyers generally are asking for contracts. A price advance is expected about

July 1. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1747. Jobbers quote:

Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ⅞ x 4 in., 50 and 10 per cent off; larger sizes, 40 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 40 off; hot pressed nuts, square tapped and hexagon tapped, $2 off; coach or lag screw, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are canceled.

Rails and Track Supplies.—The leading interest has received specifications on most of the tonnage of rails allotted to it from the order by the Railroad Administration, and is rolling some of it now. There continues to be a moderate demand for light rails for road building work. Among recent orders from this source was one for 400 tons. There is little activity in track supplies.

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c. Pittsburgh and Chicago; tie plates, iron, 2.75c. f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Cast-Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. has received orders for 800 tons from Dearborn, Mich., 70 tons from Hammond, Ind., and is the lowest bidder on 1000 tons to be awarded by Akron, Ohio. The Lynchburg Foundry Co. is the low bidder on from 300 to 500 tons to be let by Saginaw, Mich. Chicago will let 940 tons on July 2 and the Lucas County Commissioners, Toledo, Ohio, will receive bids on 1000 of 6- and 8-in. water mains on June 24. Laural, Neb., took bids on 120 tons on June 20, and Decorah, Iowa, will take bids on 125 tons on July 16.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in. $54.80; 6-in. and larger, $51.80; class A and gas pipe, $1 extra.

Old Material.—Dealers are absorbing most of the scrap put on sale by the railroads and the Ordinance Department of the Army because they are willing to offer more than the consumers. The belief of the dealers evidently is that higher prices will eventually be forthcoming from the consumers. Within the past two weeks the Ordnance Department has disposed of about 60,000 tons of scrap of which amount 22,000 tons lying in the yards of a large melter was purchased by a dealer. Yesterday the Government sold 1450 tons of 3¼-in. rounds suitable for rerolling at a price reported to be $28.50 per gross ton. Railroad lists include 2500 tons offered by the Grand Trunk, of which 1000 tons is rerolling rails, and 3000 tons offered by the Rock Island. The market continued to show an upward trend as the result of the activity of the dealers.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity all freight and transfer charges paid, as follows:

Iron rails	$21.00 to $22.00
Relaying rails	35.00 to 45.00
Carwheels	22.50 to 23.50
Steel rails, rerolling	19.50 to 20.00
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	17.00 to 18.00
Frogs, switches and guards cut apart	17.00 to 18.00
Shoveling steel	16.50 to 17.00

Per Net Ton

Iron angles and splice bars	$19.00 to $20.00
Steel angle bars	17.00 to 17.50
Iron arch bars and transoms	23.00 to 24.00
Iron car axles	28.50 to 29.50
Steel car axles	25.50 to 26.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	10.50 to 11.00
Cut forge	16.00 to 16.50
Pipes and flues	13.25 to 13.75
No. 1 railroad wrought	17.00 to 18.00
No. 2 railroad wrought	15.75 to 16.25
Steel knuckles and couplers	16.75 to 17.25
Coil springs	18.25 to 18.75
No. 1 cast	21.00 to 22.00
Boiler punchings	20.00 to 21.00
Locomotive tires, smooth	17.50 to 18.00
Machine shop turnings	6.50 to 7.00
Cast borings	9.50 to 10.50
Stove plate and light cast	17.50 to 18.50
Grate bars	16.00 to 16.50
Brake shoes	15.00 to 16.00
Railroad malleable	16.00 to 17.00
Agricultural malleable	16.00 to 16.50
Country mixed	12.00 to 13.00

Philadelphia

PHILADELPHIA, June 24.

The moderate improvement in the steel trade, which has been in evidence for several weeks, continues without gathering the momentum necessary to establish really good conditions. Mill operations, though showing some betterment in certain lines, are not exceeding 50 per cent of the capacity of Eastern plants. One structural steel company which has a five-day, single-turn schedule for this week found it necessary to change rolls on every mill at least once a day to keep operations going the full time. News of the acceptance of the peace treaty by the Germans has had a favorable effect upon sentiment, some sellers believing that this will signalize the beginning of a much better demand. June sales records are undoubtedly the best of any month this year. One steel company outside this district, with a local sales office, has booked a larger tonnage here thus far in June than its total sales during the first five months of the year.

Some of the steel companies are engaged in a controversy with the Railroad Administration over the question of prices to be charged on steel for cars furnished during the past six months. H. B. Spencer of the Railroad Administration has notified car builders that their bills will not be approved if they contain charges for steel in excess of the schedules in effect from Jan. 1 to March 21 and from March 21 up to the present. For example, if an order for plates was placed at 3c., Pittsburgh, prior to March 21 and shipped after March 21, when the current quotation was 2.65c., the car builder must charge the steel at the price at time of shipment. Car builders have asked some of the steel companies to make them this allowance, which amounts to a revision of all orders to the price at time of shipment rather than the price at time of sale.

Ferromanganese producers last week reduced their price to $110. After booking orders for 3000 tons, a leading producer in this district advanced its price to $125 again on Monday.

The scrap market shows more activity, a leading Eastern steel company having asked bids for 5000 tons of No. 1 heavy melting steel. The high bids which are being submitted for Government scrap have helped to stiffen the market. We quote heavy melting steel at $17 to $18, delivered, but probably it could not be purchased below the maximum.

Pig Iron.—The demand for pig iron for second half of the year has not come up to expectations in this district, though the volume of current business is considerably in excess of that which sellers were booking a few weeks ago. Foundry iron is being bought mostly in small tonnages. There is a fair demand for prompt shipment iron, the disposition to buy from hand-to-mouth still being prevalent to a large extent. No. 2 X iron is available at $29.50 to $30, delivered, these prices ruling on a majority of transactions, though as low as $29, delivered, was done last week on several hundred tons. Most of the furnaces are making a differential of $1 a ton between No. 2 plain and No. 2 X, though one furnace has made the differential as low as 50c. Two Virginia furnaces are now selling on the basis of $25.50 for No. 2 plain and $26.50 for No. 2 X, f.o.b. furnace, the freight rate to Philadelphia being $4.10. One of these furnaces will accept orders at this price only for delivery in the next 60 days, while the other will take second half contracts at the prices mentioned. The Worth Steel Co., Claymont, Del., has been inquiring for basic iron and will probably buy several thousand tons. The lowest price yet done in this district on basic is $25, f.o.b. furnace. Sales of low phosphorus iron are few and prices remain unchanged, $35 for copper bearing and $38 for copper free, f.o.b. furnace. There was no interest among consumers in the offering of 3100 tons of standard low phosphorus iron by the Philadelphia District Salvage Board of the Ordnance Department. Bids were taken last week for the second time and the only bidders were two dealers. As three bids must be submitted, the bids were rejected. The high bid was $23.70, f.o.b. Burnham, Pa., where the iron is stored. The first time bids were taken the high bid

was $36, but it was not accompanied by a certified check, and hence was rejected. We quote standard grades of iron delivered Philadelphia or vicinity as follows, except that f.o.b. furnace prices are given for low phosphorus grades:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$29.50 to $30.10
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	28.50 to 29.60
Virginia No. 2 X (2.25 to 2.75 sil.)	30.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	29.60
Basic	25.50 to 26.00
Gray forge	25.50 to 26.00
Malleable	31.15
Standard low phosphorus (f.o.b. furnace)	38.00
Copper bearing low phosphorus (f.o.b. furnace)	35.00

Ore.—One seller of Lake Superior iron ore notes an improvement in demand from Eastern furnace operators. A few weeks ago, many of these operators did not know what action to take with regard to covering their ore requirements for next season, but the betterment in the pig iron demand and the belief that pig iron prices will not go lower have imbued them with more optimism. Two sales have been made, one of 25,000 tons and one of 20,000 tons of ore, and another 20,000 ton deal is pending. Manganese ore continues to come in, though there are larger stocks in this country now than are needed. Last week's imports included 1500 tons from Brazil and 73 tons from Cuba. An Eastern steel company has bought 32 cars of low-grade Colorado manganese ore which was at the plant of the Seaboard Steel & Manganese Corporation. The price paid for the entire lot is said to have been about $300. The ore analyzed about 20 to 27 per cent manganese.

Ferroalloys.—Fearing that British makers of ferromanganese, who recently established a price of $121, seaboard, would be able to take American business, a leading producer of ferromanganese last week reduced its price from $125 to $110, delivered, for the 78 to 82 per cent grade. At this price, 3000 tons was booked. Other ferromanganese makers also reduced their prices. On Monday of this week the producer who first reduced prices notified the trade that no further orders would be taken at $110 and its nominal asking price is again $125. There is practically no demand for spiegeleisen, which could be bought for $35 or less for the 18 to 22 per cent.

Billets and Slabs.—The demand for semi-finished steel is mostly for small tonnages. Several sales of forging billets have been made in the past week. We quote open-hearth rerolling billets at $42.50; forging billets at $54, and slabs at $45, delivered Philadelphia.

Plates.—Makers of plates complain of the lack of demand. The plate situation is worse than any phase of the steel business. Many mills are inactive or only partially operating. Prices show some weakness, concessions of $1 and $2 a ton being frequently reported. The Sun Shipbuilding Co., Chester, Pa., has placed an order for 7000 tons of plates and shapes with a Pittsburgh mill. The Chester Shipbuilding Co., Chester, Pa., is inquiring for 4500 tons of plates and shapes for a 14,000 ton ship. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has also inquired for several thousand tons of boat steel. We quote plates at 2.895c., Philadelphia.

Structural Material.—Although no large building projects are in the market, the steel companies report that they are booking a better tonnage of small orders. Concessions of $1 and $2 a ton are reported to have been given on shapes, though the formal quotations of makers are still on the 2.45c. Pittsburgh base, or 2.695c., Philadelphia.

Bars.—There continues to be a fairly active demand for steel bars, but bar iron is dull. The New England trade is buying special machinery bars and jobbers are putting in fair stocks of merchant bars. We quote soft steel bars and bar iron at 2.595c., Philadelphia. For double refined bar iron, 1c. a lb. more is charged.

Sheets.—A Pittsburgh interest is reported to have booked some fair-sized orders for sheets in this district. Some mills complain that business is dull. We quote No. 10 blue annealed sheets at 3.795c.; No. 28 black at 4.595c., and No. 28 galvanized at 5.945c., all Philadelphia.

Bolts, Nuts and Rivets.—An Eastern mill was low bidder on 1100 tons of bolts required by the Emergency Fleet Corporation. The bids were opened last week. The order has not been placed. A large part of the schedule consists of extra large machine bolts, threaded and galvanized, for which the low bid was $4.78 per 100 lb. This was $9 a ton under the next lowest bid. For discounts on bolts, nuts and rivets see page 1747.

Old Material.—An Eastern steel company this week came into the market for 5000 tons of No. 1 heavy melting steel for third quarter delivery, this being the first important inquiry for steel scrap in many weeks. Contrary to the company's general custom, a formal inquiry was put out, which had the effect of stiffening the views of many dealers as to prices. The present scrap market is highly speculative, as is indicated by some of the bids submitted by dealers for Government scrap. On 8000 tons of shell scrap at Orange, Mass., the first bids were rejected, and a week later new bids were taken, which averaged at least $1 a ton higher than the first bids. Meanwhile, no important change had occurred in the scrap market to bring out these higher offerings. Briggs & Turivas, New York, were high bidders on this lot, their bid being $16.27, f.o.b. Orange. On this same offering an eastern Pennsylvania steel company put in a bid equivalent to $18.67 at its plant and the bid of a Pittsburgh steel company was equivalent to $20.22, delivered at its works. On 5000 tons of shell steel at Morgan, N. J., Max Solomon, a Pittsburgh scrap dealer, was high bidder, his bid being $17.41, f.o.b. Morgan. One eastern Pennsylvania steel company bid $16.25 and another bid $15.70. The lowest bid was $14.57. Much of the increased strength in the local scrap market this week is due to these high bids for Government scrap. No. 1 heavy melting steel is now quoted at $17 to $18, though dealers doubt whether a large tonnage could be bought much less than $20, delivered. Other grades of scrap show corresponding strength, steel-making grades in particular being strong. We quote for delivery at consumers' works eastern Pennsylvania as follows:

No. 1 heavy melting steel	$17.00 to $18.00
Steel rails, rerolling	18.50 to 19.50
No. 1 low phosphorus, heavy, 0.04 and under	23.00 to 24.00
Iron rails	23.00 to 24.00
Carwheels	23.00 to 24.00
No. 1 railroad wrought	22.00 to 23.00
No. 1 yard wrought	21.00 to 22.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	13.50 to 14.00
Bundled skeleton	13.50 to 14.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	12.00 to 13.00
Mixed borings and turnings (for blast furnace use)	11.00 to 11.50
Machine-shop turnings (for rolling mill and steel works use)	12.00 to 13.00
Cast borings (clean)	13.00 to 14.00
No. 1 cast	22.00 to 23.00
Grate bars	18.00 to 19.00
Stove plate	18.00 to 19.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications	18.00 to 19.00
Ungraded pipe	13.00 to 14.00

Buffalo

BUFFALO, June 23.

Pig Iron.—While there is still a considerable interest in pig iron manifested by melters during the past week the rate of contracting has been at a slower pace than for the preceding week, and the aggregate of sales reported by producing interests was perceptibly less. One interest places its total at 20,000 tons, foundry grades and malleable, taken largely by New England and New York State concerns. This total includes one lot of 3000 tons and one of 1000 tons 1.75 to 2.25 silicon grade, sold at $26.25 furnace Buffalo; 1500 tons of

malleable sold at $27.25 furnace; a fairly good tonnage of No. 1 foundry, 2.75 to 3.25 silicon, at $29.75, and a smaller tonnage of higher silicon, 3.25 to 3.75, at $31.25. Another furnace interest advises that its business for the week showed no large tonnages and was composed almost wholly of 200 and 300 ton lots, which, although aggregating a very good total, was much lighter than for the preceding week. Another producer whose furnaces have been out for relining and repairs reports bookings of only 5000 tons, about 4000 tons foundry grades and 1000 basic, taken at full schedule prices. Inquiry is still heavy and general as to grades, but there are some indications that a number of consumers have satisfied their requirements for a considerable period ahead. Some producing interests state also that they have comparatively small tonnages remaining to be sold through the remainder of the year, with a consequent disposition to raise their schedule of prices. Shipments continue to be of exceedingly good volume, but there has developed during the past week a slight shortage of empty cars, which furnacemen fear may become more pronounced as the demand for shipment increases. We quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$29.75
No. 2X, 2.25 to 2.75 silicon	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon	$26.25 to 27.00
Gray forge	25.75 to 26.00
Malleable, silicon not over 2.25	27.25
Basic	25.75
Basic, 1 to 1½ per cent manganese	26.25
Basic, 1½ to 2½ per cent manganese	26.75
Bessemer	27.95
Lake Superior charcoal, regular grades, f.o.b. Buffalo	32.35

Finished Iron and Steel.—Improvement in demand continues in practically all lines. Business in bar materials is relatively larger than for plates and shapes. An enormous demand for wire nails for export is noted; one local mill being so filled with foreign orders in this line that it is working night and day. Good export demand for billets is also noted. Domestic inquiry for wire rods of various sizes is developing. Orders in general lines seem to be pretty well distributed and mills are becoming more adequately filled up on rolling schedules, so that delivery promises are becoming more extended than they were a short time ago. The Corrugated Bar Co., Inc., Buffalo, has recently closed a contract with the Jackson Candy Co., Milwaukee, for 800 tons of reinforcing bars for a factory building to be erected in that city. The American Bridge Co. has been awarded the contract by the city of Buffalo for rebuilding three viaducts over railroads, at Hamburg Street, Elk Street and Abbott Road, requiring 3000 tons of fabricated steel.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28 galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Old Material.—Sales made this week have been principally to out-of-town buyers, local consumers apparently having a sufficient stock of scrap to carry them for a while on their present reduced capacity of mill output are buying very little and the current market is consequently to a considerable extent a dealer's market. A feature of the week is that scrap dealers that took on contracts two or three weeks ago are now endeavoring to secure materials with which to fill same at a higher price than that at which they sold. It is reported that offers for heavy melting steel have been received from Pittsburgh and Valley points of $19, delivered. A sale of 1500 tons of shell forgings at Batavia, N. Y., to a New York scrap dealer at $17.69, f.o.b. cars Batavia, is reported; also the closing of a sale in Toronto on Saturday last of 7255 tons of open-hearth steel shell forgings and open-hearth steel solid slugs from the plant of the British Forgings, Ltd., Toronto. The Toronto District Salvage Board is selling to-day, June 23, 6608 tons of 5½ in. gothic square open-hearth steel billets, on behalf of the United States Government. Prices in all lines are firmly held and car wheels have been advanced to $22.50 to $23.50 per ton.

We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades	$16.50 to $17.00
Low phosphorus, 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	20.00 to 20.50
No. 1 machinery cast	22.50 to 23.00
Iron axles	26.00 to 27.00
Steel axles	26.00 to 27.00
Carwheels	22.50 to 23.50
Railroad malleable	19.00 to 20.00
Machine shop turnings	8.00 to 9.00
Heavy axle turnings	13.00 to 14.00
Clean cast borings	11.50 to 12.50
Iron rails	23.00 to 24.00
Locomotive grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Wrought pipe	15.00 to 16.00
No. 1 busheling	14.00 to 15.00
Bundled sheet stamping	12.00 to 13.00

Cincinnati

CINCINNATI, June 24.

Pig Iron.—Lake furnaces have sold some foundry iron in this territory for last-half shipment. A lot of approximately 2500 tons was taken by a Springfield, Ohio, company and another round tonnage by a New York melter. It is understood that the iron was sold considerably below the regular schedule. A Central Ohio melter also bought from a Southern Ohio furnace 2000 tons of foundry iron for last-half shipment. Some Southern furnaces which have been freely offering to equalize freight rates on iron are now holding back and are not willing to absorb the difference beyond a certain fixed amount. However, a few sales are still being made that figure at $24.50, Birmingham, for 1.75 to 2.25 silicon.

As Hanging Rock furnaces are fairly well sold up they are now asking $26.75, Ironton, but on desirable business this figure has been shaded. The Standard Sanitary Mfg. Co. bought through its Pittsburgh office an additional 7000 tons of Southern foundry for its Louisville plant. So far as is known no foundry iron has been sold for next year's shipment, and a few Southern furnaces refuse to quote even for last-half quarter of this year. Ohio silvery irons are moving a little more slowly, but the furnaces are still maintaining the full schedule, several of them expect to blow out soon. Occasional lots of Lake Superior charcoal are disposed of in different districts. It is rumored that a Southern Ohio producer recently sold in St. Louis territory approximately 20,000 tons of basic, most of which, it is understood, is for this year's shipment.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25 (base price)	$28.10 to $28.60
Southern coke, silicon, 2.25 to 2.75 (No. 2 soft)	29.60
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	28.55
Basic, Northern	27.55
Standard Southern carwheel	51.60
Malleable	29.05
Lake Superior charcoal	32.35 to 33.35

Coke.—There is no call for furnace coke in this territory for any delivery, but some sales for last half shipment of foundry coke are reported by different selling agencies. As far as can be ascertained, producers are not anxious to take on any business for next year, although it is understood that some furnace coke has been sold for future delivery. The recent advances made in the Connellsville district appear to be established. Furnace coke there is quoted at $4 to $4.25 and foundry from $5.50 to $5.75. Pocahontas foundry grades are unchanged at $6 to $6.50, but Wise County coke has been advanced to $7.50, as leading producers there are not inclined to take on any more business at present.

Finished Material.—The sheet mills in this territory will close down July 1, as usual, in order to make necessary repairs, but they probably will have enough stock in hand to take care of the current demand. The jobbers and sheet metal contractors, in anticipation of this shutdown, have been buying galvanized sheets

lately in larger quantities than usual. The nearby mills quote No. 28 black sheets at 4.35c. and No. 28 galvanized at 5.70c., Pittsburgh basis, with a freight rate of 23c. to Cincinnati. Wire nails are still being sold by jobbers at $3.75 per keg base, but they report business as being rather light in spite of the fact that building operations have started up at a fairly rapid rate. Cold-rolled shafting is also light and the discount on out-of-town shipments is 5 per cent off list. The call for steel bars and small structural shapes is picking up gradually.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, $3.75 per keg base.

High Speed Steel.—Last week was a more encouraging one, as sales reported by different firms were more numerous and call for larger amounts. No change in the quotation of $1.60 per lb. on standard brands has been made.

Old Material.—As far as prices are concerned, the market is a little spotty with advances made on only a few grades. Rerolling steels rails for melting and old car wheels have all been marked up 50c. a ton. Cast borings are also a little higher, due to the better demand for them from nearby sources. All other quotations are unchanged, but very firm. The Youngstown-Pittsburgh mills are not buying as heavily as usual, but there is considerable scrap moving eastward on former contracts. The following are dealers' buying prices f.o.b. at yards, in carload lots, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	$10.00 to $10.50
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	17.50 to 18.50
Heavy melting steel	14.00 to 14.50
Steel rails for melting	14.50 to 15.00
Old carwheels	18.00 to 18.50
No. 1 railroad wrought	15.00 to 16.00
Per Net Ton	
Cast borings	$6.50 to 7.00
Steel turnings	5.50 to 6.00
Railroad cast	17.00 to 18.00
No. 1 machinery	17.50 to 18.00
Burnt scrap	11.50 to 12.00
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	14.00 to 14.50
Pipes and flues	12.00 to 12.50
Malleable cast	12.00 to 12.50
Railroad tank and sheet	9.00 to 9.50

St. Louis

ST. LOUIS, June 23.

Pig Iron.—Although there continues to be some buying, mostly for the third quarter because the furnaces do not want to commit themselves for the last quarter, the aggregate has not as yet assumed any very large proportions. It is, however, seemingly improving as the industries feel more and more the pressure of general demand and as such producers as stove plants approach the time when they must get their output in line for the fall and winter business. The general feeling is that after the holidays there will be better buying. Purchases so far have been altogether in small individual amounts. The local furnace has gone out of blast for two months to install a casting machine and two new stoves as well as other improvements aggregating about $750,000.

Coke.—Buying of coke has been largely confined to renewals of contracts for the last half of the year, rather than renewal for the full year to July 1, 1920, as would normally be the case were conditions more stable. There has also been some buying for domestic fuel purposes.

Finished Iron and Steel.—The small buying which has characterized the finished products market continues to grow steadily, if slowly, as new construction work comes into line, but the larger contracts which are reported to be progressing through the architects' offices have not reached the point of actual buying. Warehouse business is somewhat better each week, the volume of immediate demand increasing as a result of really immediate necessities in reconstruction, repair and similar work. We quote for stock out of warehouse as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—In the scrap market, dealers continue to hold their material and as the large consumers are not buying, there is a state of deadlock. The dealers are taking considerable material from the railroads and from each other, but the larger mills and foundries are not disposed to buy anything except what they regard as bargain material worth laying up in the yards and carrying against the future. Most of the large consumers are still shut down and are not expected to become active until after the turn of the half year. The only large buyer in the market is the National Enameling & Stamping Co., which took two fair tonnages of steel scrap at about $1.50 under the market, but was unable to get more. There is some buying of a few commodities for special use, otherwise the market is purely speculative. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$22.50 to $23.00
Old steel rails, rerolling	19.50 to 20.00
Old steel rails, less than 3 ft	17.00 to 17.50
Relaying rails, standard sections, subject to inspection	34.00 to 37.00
Old carwheels	23.50 to 24.00
No. 1 railroad heavy melting steel	17.50 to 18.00
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.50 to 14.00
Frogs, switches and guards, cut apart	18.00 to 18.50
Ordinary bundled sheets	10.00 to 10.50
Heavy axle and tire turnings	11.50 to 12.00
Per Net Ton	
Iron angle bars	$16.50 to $17.00
Steel angle bars	15.50 to 16.00
Iron car axles	30.50 to 31.00
Steel car axles	29.00 to 29.50
Wrought arch bars and transoms	21.00 to 21.50
No. 1 railroad wrought	16.75 to 17.25
No. 2 railroad wrought	16.00 to 16.50
Railroad springs	15.50 to 16.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	17.00 to 17.50
No. 1 dealers' forge	12.50 to 13.00
Cast iron borings	8.50 to 9.00
No. 1 busheling	15.00 to 15.50
No. 1 boiler cut to sheets and rings	14.00 to 14.50
No. 1 railroad cast	21.50 to 22.00
Stove plate and light cast	16.00 to 16.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	14.00 to 14.50
Pipes and flues	14.00 to 14.50
Heavy railroad sheet and tank	14.00 to 14.50
Railroad grate bars	15.00 to 15.50
Machine shop turnings	9.00 to 9.50
Country mixed	13.50 to 14.00
Uncut railroad mixed	15.00 to 15.50
Horseshoes	18.50 to 19.00

Birmingham

BIRMINGHAM, ALA., June 23.

Pig Iron.—The Birmingham iron market is active with the basis of most sellers at $24.75 for 1.75 to 2.25 silicon and $25.25 for 2.25 to 2.75 silicon. One concern booked 8000 tons in one day during the week. The leading interest, which does not figure prominently in the foundry market regularly, is understood to have sold a considerable quantity for last half delivery and is reported to be still in the market. Another, with one active stack, has disposed of capacity and accumulations three months ahead and an additional stack will probably get to work in the near future. A large interest admits the booking of three months' capacity and shut its books for fourth quarter tight in confident expectation of higher prices. One seller is altogether out of the market except on high manganese iron, for which the regular trade pays a premium. A fifth interest is still operating on former bookings made on higher price level and has not taken on much new business. It has, however, placed some tonnage at $1 over the general level. The bulk of the tonnage has been placed in the South owing to the greater activity in pipe plants, stove works and foundries gen-

erally. The next largest tonnage was placed in St. Louis territory on a varying basis founded on freight differentials. The Tennessee company has seven stacks on basic, one on ferromanganese and one on recarburizing. Outside of one interest stout denial is made of booking fourth quarter business. The inquiry is brisk and beginning to become anxious. General opinion is that higher prices are coming soon. Steel mills have made large bookings of wire and nails and operations have become more extensive. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry 1.75 to 2.25 silicon	$24.75
Basic	23.75

Cast Iron Pipe.—Sanitary shops are as busy as shortage of expert labor admits with outlook of good business throughout the remainder of the year. The leading pipe interest booked 1000 tons of water pipe for Guthrie, Okla., 900 for Cushing and small tonnages for Charlotte, N. C., and Social Circle, Ga. The gas and water pipe order of 1300 tons by the Sloss-Sheffield Steel & Iron Co. for its by-product works went to the leading interest and American company. Prices tend higher than the present $45 level. Inquiry is good, bookings considerable.

Coal and Coke.—Makers of high-grade foundry coke are unable to get in additional ovens with the dispatch required to meet the increased demand from stove works, pipe shops and the general foundry trade. The $8 level is maintained on account of competitive offerings of West Virginia coke. Steam coal is picking up with increased output and demand.

Old Material.—Scrap dealers at the close of last week said the spurt in steel had not yet reached them, but that they were confident of early increase in prices. Both light and heavy cast are going well. Yard accumulations have reached a formidable stage, but dealers are not worried on account of their confidence in an early favorable turn all around. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$12.00 to $14.00
No. 1 heavy steel	12.00 to 13.00
Cast iron borings	6.50 to 7.50
Machine shop turnings	6.50 to 7.50
Stove plate	15.00 to 16.00
No. 1 cast	20.00 to 22.00
Car wheels	20.00 to 22.00
Tramcar wheels	20.50 to 22.00
Steel axles	18.00 to 20.00
No. 1 wrought	12.50 to 13.00

New York

NEW YORK, June 24.

Pig Iron.—Following the recent heavy buying at lower prices, the market is very quiet. It has developed that on the recent buying movement basic pig iron sold as low as $23, Buffalo, a cut of $2.75 below the last Washington schedule, while price reductions on all foundry grades were also large. About the best that can be said about the Buffalo market at the present time is that the very low prices have been eliminated and some buyers are able to sell limited tonnages at as high as $28 for No. 2 X and $27 for No. 2 plain, but it is probable that with a large tonnage price concessions would again be made. Pennsylvania furnaces are not granting concessions as freely as they did, but there is not very much evidence of market stability. Considerable inquiry for basic and other grades for export is pending, but some of the inquiry is not being taken very seriously, especially one for a large tonnage of basic for which the exporter offered to pay $20. Limited tonnages of foundry iron are, however, being exported. Among the sales of the last few days have been 150 tons of foundry iron for Antwerp and 250 tons for South America. Much complaint in regard to the slowness of the cables continues to be heard. We quote as follows, delivered New York, for Northern and Southern grades, quotations on the latter being nominal:

No. 1 foundry, silicon, 2.75 to 3.25	$31.55 to $21.80
No. 2 X, silicon, 2.25 to 2.75	29.80 to 30.80
No. 2 plain, silicon, 1.75 to 2.25	28.55 to 29.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	31.40 to 31.90
No. 1 Southern, silicon, 2.75 to 3.25	32.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75	30.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	29.45

Ferroalloys.—A rather unusual experience has featured the market for ferromanganese in the last week. It appears that one or two American producers, having become suddenly apprehensive that British makers were about to offer their product in the American market under the foreign quotation of $121 seaboard, and thus possibly obta . the fairly numerous inquiries before the market, decided to offer the American product at $110 and so notified their competitors. As a result, it is understood that two American producers obtained orders for about 3000 tons at $110, delivered. It appears, however, that to-day the situation is viewed in a different light and producers are generally quoting $125, delivered, for 78 to 82 per cent alloy, with $1.50 deducted for each unit under 78 per cent. The market is quiet with two inquiries reported, one of 500 tons for the last quarter and one for 100 tons for the last half. There is an inquiry for 500 tons of spiegeleisen for the last half, but otherwise the market is extremely quiet at about $28 to $30, furnace, for 18 to 22 per cent alloy. The market for ferrosilicon, 50 per cent, is quiet at $75 to $80 per ton, delivered.

Finished Iron and Steel.—The structural steel market is showing increasing signs of life. While there is not yet the activity in the East that has been in evidence in the Central West, conditions are much better and it is estimated that total contracts in June in the whole country will aggregate 100,000 tons, which is about 50 per cent of normal. The Cunard Steamship Co. will build a 24-story office building on Broadway near the Battery, the general contract for which has been let to Irons & Todd, 101 Park Avenue, New York; about 8000 tons of structural steel will be required. This is the largest local building to come definitely into the market since the signing of the armistice. Another large building is to be built by the Rudolph Wurlitzer Co. at 116 West Forty-second Street, New York, taking 2700 tons, for which bids are going in this week. The George A. Just Co., Long Island City, will fabricate 1200 tons for a 12-story loft building to be erected at Sixth Avenue and Forty-first Street, New York. The contract for an office building for the Chicago Pneumatic Tool Co. in New York, taking 600 tons, will probably be let this week. Contracts awarded are as follows: The American Bridge Co., 1400 tons for a dry dock and ship repair plant for W. & A. Fletcher Co., Hoboken, N. J.; Levering & Garrigues Co., 1500 tons for the Park & Tilford candy factory; Belmont Iron Works, 1800 tons for the Eastern Rolling Mills Co., Baltimore; Phoenix Bridge Co., 1300 tons for pier shed No. 30 at South Philadelphia; American Bridge Co., 700 tons for the Federal Sugar Refining Co., Yonkers, N. Y.; Bauman Iron Works, 300 tons for a motion picture theater at Wilkes-Barre, Pa.; New England Structural Co., Boston, 700 tons for the Hamilton Mfg. Co., Lowell, Mass. Bids were put in this week on a 500-ton addition to the New York Stock Exchange, a 300-ton alteration job at the Watervliet Arsenal, Watervliet, N. Y.; a warehouse for the B. F. Goodrich Co. at Akron, Ohio, taking 1400 tons, and bids are being asked for on 300 tons for a knitting mill at Carlisle, Pa. The Bailey, Banks & Biddle building in Philadelphia, which has been in the market for several weeks, will be built of reinforced concrete. Two new theaters are to be built on West Forty-second Street, New York, and a new hotel building on Park Avenue. Locomotive and car builders are expecting foreign orders to develop soon after the signing of the peace treaty. At present there is much idle capacity. Two plants of a leading locomotive company are shut down. The Cuba Railroad has ordered 500 cars, of which 200 box cars were awarded to the American Car & Foundry Co., 100 to

the Magor Car Corporation, and 200 flat cars to the American Steel Co. of Cuba. General export business so far this month has shown an improvement over any month this year. A large part of the business has been in wire products, particularly barbe wire for South America, and some wire companies have taken considerable business in the past few weeks. The Jones & Laughlin Steel Co. has advanced its export price on wire nails $5 per net ton and on all other wire products $2 per net ton. Other wire companies have not changed their export prices, but some of them are considering doing so. Not a great deal of steel business is being done with European countries, but it is expected that a 3000-ton inquiry for plates for Italy may be closed soon. Light rails have been in demand and a 5000-ton order was recently placed with some concession in price. Exporters find high freight rates a bar to doing business with some parts of the world and they entertain hopes that the Shipping Board will soon announce further reductions. Domestic business is showing a slight improvement, particularly as regards structural material, as above noted, but plates are not greatly in demand. Several makers are now offering commissions to brokers of from $1 to $2 a ton to encourage business. There is a fair demand for steel bars, but bar iron is not active. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Warehouse Business.—Improvement in buying continues at a pace slightly better than was established last month, one of the larger factors in the trade reporting about 40 per cent increase in the rate this month, as compared with a 20 per cent increment in May. Houses carrying comprehensive stocks in any one line are meeting a good miscellaneous demand for small lots, this being true as well as regards plates, which have generally been moving sluggishly. Structural lines are showing greater activity, and the tendency to want the material for immediate use is favoring warehousing. Hot-rolled soft steel bars are being taken more freely for general manufacturing purposes. Reinforcing bars also are being disposed of in somewhat larger tonnage following the gradual betterment in the building trades. The slow pick-up in construction work, acting also to effect a marked inactivity among general contractors, is holding back trade in bolts and nuts, pipe and fittings, and similar supplies. For the latter the call is of small scope. Prices in this line are more stable, however, price-cutting having been mostly eliminated. Jobbers report orders for long lists of these goods in small lengths and quantities, evidence of a strong inclination to cover only immediate needs. Purchases of cold-rolled shafting are beginning to come forward for next quarter requirements and some are said to be entertaining proposals extending over the last half. Actual orders are holding in volume for the present. In the sheet trade forward buying is waiting for the conclusion of peace. Dealers carrying them in limited stocks are understood to favor now a closer adherence to the general scale of prices. Galvanized sheets show the largest range in quotations, attractive business having been taken as low as 6.20c. We quote No. 10 blue annealed sheets, 4.57c.; No. 28 black sheets, 5.37c.; No. 28 galvanized sheets, 6.50c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands 3-16 in., No. 10 and 12, 4.07c.

High-Speed Steel.—A perceptible improvement in the volume of orders is reported in some quarters over a period of the past week or ten days. Otherwise the market shows no change over the past few weeks. British competition is not generally considered a serious threat to domestic makers so long as demand remains virtually stagnant. We quote an average price of between $1.50 to $1.60 per lb.

Cast-Iron Pipe.—The extent to which the cast-iron pipe prices are being cut is illustrated in the case of 1175 tons on which bids were recently received by the city of Boston. The low bidder, R. D. Wood & Co., Philadelphia, bid $50 delivered, the tonnage being 240 tons 8-in.; 160 tons 10-in.; 600 tons 12-in.; 116 tons 6-in.; 15 tons 24-in. As the freight is $4.10, the company will receive $45.90 at its plant. No new important municipal business is in sight, but there is considerable private buying. We quote New York prices as follows: 6-in. and heavier, $50; 4-in., $53; 3-in., $60, and $1 additional for class A and gas pipe.

Old Material.—The market is plainly a speculative one, brokers being willing to pay from $1 to $2 a ton more for heavy melting steel than consumers; for instance, as is indicated by recent purchases of Government scrap at auction. Most transactions are in steel. Brokers and dealers are now confident that the Government scrap being sold in fairly large quantities will not hurt the market and will be readily absorbed. The market is clearly in an excited state, intensified by the preceding period of comparative calm. Besides purchases of Government scrap by New York firms mentioned in the Philadelphia market column, there was a purchase of 90 tons of rail scrap, not suitable for rerolling, by the Midvale Steel & Ordnance Co., for $15.40, f.o.b. Trenton, the freight rate being $1.60; Luria Bros. & Co., New York, purchased from the Government 6000 tons of shell scrap for $17.10, f.o.b. Baltimore.

Heavy melting steel	$13.50 to $14.50
Rerolling rails	16.50 to 17.00
Relaying rails, nominal	40.00 to 41.00
Steel car axles	22.00 to 23.00
Iron car axles	27.00 to 28.00
No. 1 railroad wrought	19.50 to 20.00
Wrought iron track	14.00 to 14.50
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	17.50 to 18.00
Light iron	8.00 to 9.00
Cast borings (clean)	9.50 to 10.00
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	7.50 to 8.00
Iron and steel pipe (1 in. minimum diameter) not under 2 ft. long	14.50 to 15.00
Stove plate	15.50 to 16.00
Locomotive grate bars	15.50 to 16.00
Malleable cast (railroad)	14.00 to 14.50
Old carwheels	20.00 to 20.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$21.50 to $22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.50 to 21.00
No. 1 heavy cast, not cupola size	15.00 to 15.50
No. 2 cast radiators, cast boilers, etc.	16.50 to 17.00

Cleveland

CLEVELAND, June 24.

Iron Ore.—The improvement in the demand for pig iron has been reflected somewhat in ore sales and inquiries during the past week. Some consumers who showed no disposition two or three weeks ago to buy in the near future have come in the market, and in some cases are buying their full expected requirements. None of the sales during the week was of large tonnage. Contracts for ore for shipment to Eastern furnaces so far entered aggregate over 1,500,000 tons, according to conservative estimates. This includes around 1,250,000 tons to be taken on long-term contracts and approximately 300,000 sold on season contracts. The Berkshire Mine, an Oglebay, Norton & Co. property in the Menominee range, which has been shut down for some time, will resume operations July 1, and it is expected that some other properties that have not been operated this year will start up in the next few weeks. Ore prices, delivered f.o.b. lower Lake ports, are as follows:

Old range Bessemer, $6.45; old range non-Bessemer, $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55.

Pig Iron.—The market continued very active during the week, but inquiry has fallen off during the past few days so that some decrease in the volume of sales is looked for. Sales were made in lots up to 7000 and 8000 tons and were confined wholly to foundry and malleable grades, the percentage of the latter being small. Cleveland consumers were heavy buyers of foundry iron during the week. The Westinghouse Electric & Mfg. Co. placed 2000 tons with local furnaces for its Cleveland plant, and three or four of the largest local foundries engaged on automobile work bought liberally. Considerable tonnage was also purchased by Detroit automobile plants and allied interests, and the Ameri-

can Radiator Co. placed 4000 tons for its Detroit plant. Two Cleveland selling agencies report sales this month aggregating 225,000 tons, about 100,000 tons of which was taken during the past week. One interest is practically sold up for the remainder of the year. Some additional inquiry has come out for contracts for the first half of next year, but furnaces have not opened their books for that delivery, although some additional tonnage for that delivery has been placed in connection with last half contracts. Shipments of iron have improved, and some of the furnace companies are beginning to reduce their stock piles a little. Steel-making iron is very quiet. One inquiry has developed from central Ohio for 2000 tons of basic for July and August delivery. Local producers state that there is not so much evidence at present of shading by southern Ohio furnaces on quotations for iron for shipment to competitive points. One southern Ohio seller has been shading prices 50c. a ton for shipment to points where competition of northern Ohio furnaces had to be met. The Southern iron market is a little firmer and it is claimed that few, if any, Southern furnaces are now absorbing the freight rate on high silicon iron for shipment to northern Ohio points. Ohio silvery iron continues in good demand and sales aggregating 2300 tons are reported during the week. Some of this was in 7 per cent iron taken at $38.25, representing the recent 50c. price advance on 7 per cent silicon. We quote delivered Cleveland, as follows:

Bessemer	$29.35
Basic	27.15
Northern No. 2 foundry, silicon, 1.75 to 2.25	27.15
Southern foundry, silicon, 2.25 to 2.75	28.40
Gray forge	26.15
Ohio silvery, silicon, 8 per cent	42.65
Standard low phos., Valley furnace	$40 to 42.00

Finished Iron and Steel.—Steel bars and structural material are in heavy demand, and a large share of the trade has covered for its requirements for the third quarter or last half at regular prices. Some consumers are accumulating good-sized stocks in order to protect themselves later, should labor troubles interfere with mill operations. Recent improvement in orders is now having a noticeable effect on deliveries by some of the mills. Building work continues to come out in good volume. The King Bridge Co., Cleveland, has taken 1600 tons additional for Nickel Plate grade crossing elimination bridges in Cleveland, making 2500 tons in all. The Austin Co., Cleveland, has taken a contract for an extension to the iron and steel warehouse of the Bourne-Fuller Co., Cleveland, requiring 450 tons, and the Jones & Laughlin Steel Co. has taken the building for the Cleveland Worsted Mills, requiring 600 tons. Bids have been asked for the Euclid Avenue section of the Hanna Building, Cleveland, requiring 2500 tons, and for 500 tons for a plant addition for the B. F. Goodrich Rubber Co., Akron. The first contract for the Union passenger station in Cleveland covering retaining walls and a large amount of other preliminary work, requiring some reinforcing bars, has been placed with the Walsh Construction Co. The demand for reinforcing bars is heavy, and it is claimed that the shading of the 2.25c. price on hard steel bars has disappeared. New work to be placed shortly includes the sewage treating plant in Cleveland, requiring 900 tons of bars. There is still some shell steel in large rounds on the market, and this is being offered by brokers to forge shops at 1.75c. A price of $8 per ton under the market, or 2.05c., is being quoted on light rails rolled from shell steel. The demand for sheets has improved materially. Mills are getting a good volume of current orders, and are taking contracts for three months. Sheet prices appear to be firmer, but some mills are absorbing some of the freight equivalent to a cut of about $2 per ton. Nails and wire are in good demand. Mills are taking contracts with jobbers for delivery over 60 days at regular prices. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Coke.—There is not a great deal of activity in the coke market, although some contracts are being closed for the last half. There is practically no contracting for a full year, as foundries that ordinarily buy that far ahead are limiting their purchases to the remainder of this year. Contracts are being taken at $5.25 per net ton, which is the usual quotation for best makes of Connellsville coke.

Bolts, Nuts and Rivets.—The improvement recently noted in the bolt and nut market continues. Manufacturers are making contracts with the automobile and agricultural implement manufacturers for the last-half delivery and with other consumers and jobbers for a 3-month period. Current orders have increased in volume. With improved order books, manufacturers are talking of a possible price advance. Rivet consumers are contracting very freely for the last half at present prices, and makers are getting a fair volume of specifications on old orders. The market is firm.

Old Material.—The market has quieted down somewhat and heavy steel scrap is not as firm as it was a week ago. Mills are now showing no disposition to pay over $18 for this grade, but dealers are paying as high as $18.50, although it is reported that they have been able to make some purchases at slightly under $18. Dealers are asking mills $19 to $20 for heavy melting steel, and claim that consumers cannot buy round tonnages at under $19. The supply outside of dealers' stocks is light. We note the sale of 500 tons of compressed steel scrap to a Cleveland mill at $16, and a sale of low phosphorus melting scrap is reported at $22.50. There is very little demand for flashings, and prices on this grade are weak. A sale of wrought scrap is reported at $17.75 net. Turnings are plentiful, and both this grade and borings are quiet. The latter grade is slightly firmer. We quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$18.00 to $18.50
Steel rails, under 3 ft	20.00 to 21.00
Steel rails, rerolling	19.50 to 20.50
Iron rails	24.00 to 25.00
Iron car axles	30.00 to 31.00
Steel car axles	28.50 to 29.50
Low phosphorus melting scrap	22.00 to 22.50
Cast borings	12.00 to 12.50
Iron and steel turnings and drillings	10.00 to 10.50
Compressed steel	16.00 to 16.25
No. 1 railroad wrought	20.50 to 21.50
Cast iron carwheels	23.50 to 24.50
Agricultural malleable	16.50 to 17.50
Railroad malleable	18.50 to 19.00
Steel axle turnings	15.00 to 15.50
Light bundled sheet scrap	14.50 to 15.00
No. 1 cast	23.00 to 24.00
No. 1 busheling	15.50 to 16.00
Drop forge flashings, 10 in. and under	14.00 to 14.50
Drop forge flashings, over 10 in.	11.75 to 12.00
Railroad grate bars	18.50 to 19.00
Stove plate	18.50 to 19.00

Higher British Steel Prices

Germany Taking Neutral Orders—Millmen Demand Six-Hour Day—Pig Iron Output Deficient

(By Cable)

LONDON, ENGLAND, June 23.

German steel works are already taking steel orders for neutral markets at prices which British makers cannot touch. An increasing number of Belgian plants are offering steel and quoting £16 15s. to £17 ($77.05 to $78.20) f.o.b. Antwerp for bars and structural shapes, and £18 ($82.80) for plates for quick delivery, but shipping is difficult at present. Luxemburg works are arranging to restart at full capacity in about two months, probably making shipments by way of Antwerp.

American 4-in. billets have been sold at about $58 c.i.f., Liverpool, for July shipment.

Steel prices are rising with plates now quoted at £17 15s. ($80.50); angles at £17 5s. ($79.35); tees, plates, etc., at £19 15s. ($90.85); rails at £16 ($73.60), and beams at £17 ($78.20). Tin plates are firm at 32s. 6d. to 33s. ($7.47 to $7.59) f.o.b.

Wages have again advanced 12½ per cent and millmen are now demanding a 6-hr. day. The Welsh tin-

plate trade is sending a deputation of manufacturers and workmen to America to investigate and report on tin plate manufacturing conditions there.

The tendency of the pig iron market is unaltered and the output is gravely deficient. American pig iron is reported to have been sold, delivered here, at 15s. ($3.45) below British prices. Prices of foreign ore have advanced because of higher freight rates, Spanish Rubio ore being now quoted at fully 58s. 6d. ($13.685) c.i.f. As a consequence Hematite ore must advance.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at $4.60 for £1:

	£ s. d.	£ s. d.	
Pig iron			
East Coast Bessemer.	9 10 0 to	9 12 6	$43.70 to $44.28
West Coast Bessemer..	9 5 0 to	9 10 0	42.55 to 43.70
Cleveland No. 3 foundry	8 0 0 to	8 5 0	36.80 to 37.95
Cleveland basic	8 2 6	.....	37.37 .....
Coke (Durham):			
Furnace	1 19 0	.....	8.97 .....
Foundry	2 4 0	.....	10.12 .....
Ferromanganese	25 0 0	.....	115.00 .....
Billets	14 10 0 to	14 15 0	66.70 to 67.85
Tin plate and sheet bars.	13 15 0	.....	63.25 .....
Rails, 60 lb. and upward	16 0 0	.....	73.60 .....
			Cents per lb.
Steel bars	19 0 0 to	20 10 0	3.90 to 4.20
Large rounds, etc.	17 2 6 to	18 10 0	3.51 to 3.70
Structural material	.....	17 0 0	.... 3.49
Plates	.....	17 15 0	.... 3.64
Plates, boiler	19 10 0	.....	4.00 .....
Bar iron	.....	21 0 0	4.31 .....
Tin plates, 14 x 20, coke 112 sheets, 108 lb., f.o.b. Wales.	1 13 0	.....	$7.59 .....

Demand for Ship Steel Strong—Foreign Ore Requirements Larger—Pig Iron Scarce

(By Mail.)

LONDON, ENGLAND, June 13.—There is a very good demand for foreign ore and a much larger business might be done in this if shipping arrangements were only a little easier. At one time ship-owners were compelled to bring ore into the country as a part-cargo, but this is no longer the case, and the natural inclination is to fill up with material of a more paying description from the ship-owner's point of view.

According to figures issued by the authorities here, the total output of pig iron in this country during the week ending May 3 was 151,000 gross tons, which is made up as follows: Hematite iron 56,000 tons; basic, 44,000 tons; foundry, forge and other grades, 45,000 tons and alloys 6000 tons. For the same week the output of steel ingots and castings was 157,000 tons.

Foundry iron continues decidedly scarce, and it is impossible to satisfy all home demands. Consequently, although there is a good export inquiry this has largely to be neglected, not only on account of the scarcity of metal, but owing to difficulties in connection with export licenses, while makers are not inclined to sell for export so long as their home customers are unable to procure all their needs.

In manufactured iron and steel, the chief feature continues to be the pressure for ship material. In other descriptions such as bridge and constructional work generally, business is still quiet. Meantime manufacturers are very reluctant to commit themselves to firm quotations for forward delivery owing to the obscurity of the position as regards costs.

Structural Business Recovering Activity

Orders booked by the structural shops of the country in May amounted to 88,200 gross tons of steel, or 49 per cent of total capacity, according to the records of the Bridge Builders and Structural Society, 50 Church Street, New York, collected by its secretary, George E. Gifford. New business in May was therefore about twice that of April and four times that both of January and February. It is the largest month's business since September, 1918, when 60 per cent was contracted for, the same percentage booked in May, 1918.

IRON AND INDUSTRIAL STOCKS

Active Trading Continues Throughout the Week—Sentiment Divided on Effect of Peace

NEW YORK, June 24.

Trading continued through the week on a big scale, the evidence that Germany intended to accept Allied peace terms and other international political developments tending to sustain the activity. Steel company shares generally showed slight net gains. The definite announcement Monday that the revised peace program was accepted by the German Government found the market sentiment confused, with bullish and bearish sentiment about equally divided.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. cm.	40¼ - 43¾	Lake Sup. Corp..	19½ - 20¾
Allis-Chalm. pf..	94¼ - 96	Lima Loco.	52½ - 54¼
Am. Can. com....	53½ - 58¼	Midvale Steel ..	50¼ - 52⅝
Am. Can pf.....	105¾ - 111¼	Nat-Acme	37¾ - 39
Am. C. & Fd. cm.	105¾ - 112	Nat. E. & St. cm.	76 - 80⅜
Am. C. & Fd. pf.	— - 117¼	Nat. E. & St. pf.	102 - 102¾
Am. Loco. com..	82 - 86⅞	N. Y. Air Brake.	117 - 121
Am. Loco. pf...	109 - 109¼	Nova Scotia Stl.	80⅛ - 87
Am. Radiator cm.	— - 305	Pittsb. Stl. pf...	— - 98
Am. Ship com..	123 - 124	Pressed Stl. com.	81½ - 86¼
Am. Stl. Fdries	40¼ - 43¼	Pressed Stl. pf..	— - 104½
Bald. Loco. com.	98¼ - 106½	Ry. St. Spg. com.	89 - 92¾
Bald. Loco. pf..	109 - 110½	Ry. St. Spg. pf.	— - 108¾
Beth. Steel com.	— - 85½	Republic com. ..	87 - 90¾
Beth. Steel, Cl. B.	85 - 89½	Republic pf.	104 - 104¾
Case, J. I., pf...	99½ - 100¼	Sloss, com.	65 - 69
Cent. Fdry. com.	21 - 23½	Sloss pf.	93 - 93¼
Cent. Fdry. pf..	46⅝ - 51	Superior Steel ..	44¼ - 50¼
Chic. Pneu. Tool	76 - 79	Sup. Stl. 1st pf.	— - 105
Colo. Fuel	46 - 48¾	Transue-Williams	55¾ - 56
Cru. Steel com..	89 - 95¼	Un. Alloy Steel..	51¾ 53¾
Cru. Steel pf....	100 - 101	U. S. Pipe com.	31⅞ - 36½
Gen. Electric ..	163 - 165¼	U. S. Pipe pf...	63½ - 64½
Gt. N. Ore. Cert.	45⅝ - 47⅜	U. S. Steel pf...	105¼ - 108⅜
Gulf States Steel	60 - 66⅞	U. S. Steel com.	116¼ 116⅞
Int. Har.. com..	140¼ 144⅜	Va. I. C. & Coke	66 - 68½
Int. Har. pf.....	119 - 120	Westingh. Elec..	56 - 57½
Lackaw. Steel...	80¼ - 84½		

Dividends

The American La France Fire Engine Co., Inc., quarterly, 2 per cent on the common, payable Aug. 15, and 1¾ per cent on the preferred, payable July 1.

The American Laundry Machinery Co., quarterly, 1¾ per cent on the preferred, payable July 15.

The E. W. Bliss Co., quarterly, 62½c. and extra $5 on the common, and $1 on the preferred, payable July 1.

The Brier Hill Steel Co., quarterly, 2½ per cent on the common and 1¾ per cent on the preferred, payable July 1.

The Carbon Steel Co., quarterly, 2 per cent and extra 3 per cent on the common, payable July 15.

The Dominion Steel Co., quarterly, 1½ per cent on the preferred, payable Aug. 1.

The Elyria Iron & Steel Co., quarterly, 1¾ per cent on the preferred, payable July 1.

The Hendee Mfg. Co., quarterly, 1¾ per cent on the preferred, payable July 1.

The Hydraulic Pressed Steel Co., quarterly, 2 per cent on the common and 1¾ per cent on the preferred, payable June 30.

Manning, Maxwell & Moore, Inc., quarterly, 1½ per cent and extra 1½ per cent, payable June 30.

The Nova Scotia Steel & Coal Co., quarterly, 1¼ per cent on the common and 2 per cent on the preferred, payable July 15.

The Sloss-Sheffield Steel & Iron Co., quarterly, 1¾ per cent on the preferred, payable July 1.

The Steel Co. of Canada, quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Aug. 1.

The Trumbull Steel Co., quarterly, 1½ per cent and extra 1 per cent on the common and 1¾ per cent on the preferred, payable July 1.

The Youngstown Sheet & Tube Co., quarterly, 2 per cent and extra 1 per cent on the common and 1¾ per cent on the preferred, payable July 1.

Great Northern Ore Report

Total receipts of the Great Northern Ore properties in 1918, according to the twelfth annual report, were $4,594,725, against which are disbursements of $72,221 for the administration of the trust. The balance, $4,522,504, is the equivalent of $3.01 a share on the 1,500,000 outstanding certificates of beneficial interest. The excess of disbursements over receipts amounted to $1,477,496. Undistributed receipts at the end of 1917 were $2,079,775, cut down to $602,278 in 1918. Since Dec. 7, 1906, total receipts of the properties have been $22,158,584 and disbursements $21,556,305.

PERSONAL

The recent reorganization of the general sales department of the Illinois Steel Co., announced in the IRON AGE of June 5, involved the creation of three assistant general managers of sales, with headquarters at Chicago. P. W. O'Brien, assistant general manager of sales in charge of the rail, billet and pig iron division, entered the service of the Carnegie Steel Co. as a stenographer on July 1, 1886, and subsequently joined the sales force of that organization. He remained with the Carnegie Steel Co. until the United States Steel Corporation was formed, since which time he has been in the continuous employ of one or the other of the subsidiary companies. J. B. Arnold, assistant general manager of sales in charge of the structural and plate division, was employed by the purchasing department of the United States Rolling Stock Co. in 1887, and entered the sales department of the Carnegie Steel Co. in 1892, continuing with that organization until 1912, when he was transferred to the Illinois Steel Co. B. E. Hamilton, assistant general manager of sales in charge of the bar division, was first employed by the Upson Nut Co., Unionville, Conn. In 1884, he was transferred to the Chicago office of that company, and in 1898 entered the sales department of the Salem Wire & Nail Co., Salem, Ohio, remaining in the Chicago sales office of that concern until 1900. During the latter part of 1900, he was engaged in the steel brokerage business, following which he became connected with the American Steel Hoop Co., which was taken over by the United States Steel Corporation in 1901. For the past 18 years Mr. Hamilton has been connected with the bar department of the Illinois Steel Co.

The Cleveland Milling Machine Co., Cleveland, has appointed W. E. Millar as Pittsburgh district sales manager and the J. Horstmann Co. as its French agent. L. H. Mesker, vice-president of the company, has turned over the salesmanagership to H. I. Miner.

Harry G. Stoddard, vice-president and general manager, Wyman-Gordon Co., Worcester, Mass., has been reelected a director of the American Drop Forge Association.

R. Sanford Riley, president, Sanford Riley Stoker Co., Worcester, Mass., and Detroit, and also president of the Worcester Chamber of Commerce, will leave for a European trip in July.

Dr. Ira N. Hollis, president Polytechnic Institute, Worcester, Mass., and past president American Society of Mechanical Engineers, will deliver an address this week on "Engineering Colleges and Their Administration" at the annual meeting of the Society for the Promotion of Engineering Education at Baltimore.

G. S. Alston, for three years auditor of the Sharon, Pa., plant of the American Steel Foundries, has been transferred in the same capacity to the Alliance, Ohio, plant of the concern, and A. C. James has been named auditor of the Sharon plant, to succeed Mr. Alston.

J. J. Beaman has resigned as president of the Standard Fuel Engineering Co., Detroit, and has been succeeded by F. W. Willett, formerly treasurer of the company.

John O. Yoder, for six years with the Pittsburgh office of Hickman, Williams & Co., Inc., has assumed his new duties as manager of the company's general offices at Cincinnati. Prior to joining Hickman, Williams & Co., Mr. Yoder was with the Jones & Laughlin Steel Co. for nine years, having served in the offices of the chief engineer, and also in the South Side works of that company.

L. K. Goss of Cleveland has joined the sales force of the Tacony Steel Co., Philadelphia, and will act as assistant to Mr. Keefer, the Cleveland district sales manager. Mr. Goss, who recently left the Ordnance Department, was formerly manager of the small tool department and connected with the sales force of Warner & Swasey Co., Cleveland.

Charles W. Cullen has been appointed sales agent for the Damascus Mfg. Co., Cleveland, maker of cutting and washing compounds and lubricating oils. He will make his headquarters at the Savoy Hotel, Cincinnati, and will handle southern Ohio, Indiana and northern Kentucky.

L. G. Knight, manager of sales, eastern territory, Pacific Coast Steel Co., San Francisco, with offices at 52 Broadway, New York, will soon move to Seattle, Wash., and be assigned to a position in the Seattle works of the company. He will be succeeded by W. W. Truesdell, who recently returned from France where he served with a company of engineers. Before that, he had been connected with the Pacific Car & Foundry Co., Seattle, and with the Seattle works of the Pacific Coast Steel Co.

F. N. Beegle, president Union Drawn Steel Co., Beaver Falls, Pa., recently was elected a director of the Bordentown Steel & Tube Corporation, Bordentown, N. J., to fill a vacancy caused by the resignation of Isaac Levin.

Frank R. Whitehead, formerly purchasing agent, United Steel & Metal Corporation, has resigned and assumed a similar position with The Parker Co., 165 Broadway, New York, exporter and importer, with branch offices in Japan and Scandinavian countries.

C. N. Talhelm, formerly of the New York office of the Landis Tool Co., Waynesboro, Pa., is now representing the Landis Tool Co. and the Kearney & Trecker Co., Milwaukee, on the Pacific Coast.

J. U. Anderson has been made treasurer of the Trumbull Steel Co., Warren, Ohio, to succeed Lloyd Booth, resigned. He formerly was assistant to the president, having served as assistant treasurer for some time. William M. McFate, formerly secretary of the company, has been made a vice-president, and has been succeeded by A. L. Button.

Arthur King Wood, formerly president Franklin Trust Co., has been elected vice-president and treasurer of Westinghouse Church Kerr & Co., Inc.

T. L. Lewis, who recently resigned as general manager of sales of the A. M. Byers Co., Pittsburgh, maker of wrought iron pipe, has been made manager of sales of the Interstate Pipe Co., Pittsburgh, distributor of oil country goods.

F. G. Echols, for many years general manager small tools department, Pratt & Whitney Co., Hartford, Conn., has accepted a position as vice-president of the Greenfield Tap & Die Corporation, Greenfield, Mass.

C. S. Coler has been appointed manager of the educational department of the Westinghouse Electric & Mfg. Co., East Pittsburgh. He was graduated as an electrical engineer from Cornell University in 1911, and early in the same year, was appointed director of mechancial drawing in the Casino Technical Night School, an institution supported by the Westinghouse Co. to promote the education of the young men and women working for the company. After three years as an instructor, Mr. Coler was appointed manager of the school, and director of trades training of the Westinghouse company, retaining this position until his recent appointment as manager of the educational department of the Westinghouse company. He succeeded C. R. Dooley, who has accepted a position with the Standard Oil Co. to promote industrial education.

Arthur Schaeffer, formerly assistant director of sales at the home office of the Central Steel Co., Massillon, Ohio, has been appointed district manager of sales at Detroit, with headquarters at 948-950 Book Building. Frank Gibbons, associated with the Carbon Steel Co., Pittsburgh, for six years, lately as district sales manager at Detroit, has been made assistant to Mr. Schaeffer.

Maj. F. H. Schoenfuss, late metallurgical expert with the Ordnance Department, having returned from

Sweden, has associated himself with John H. Brewster, 30 East Forty-second Street, New York, American representative of Fagersta Steel Co., Sweden. Major Schoenfuss' particular duties while with the Ordnance Department were the specifications and heat treatments of all parts of all types of guns.

J. D. Waddell, president the Mahoning Valley Steel Co., Niles, Ohio, has been elected president of the newly organized Niles Chamber of Commerce.

At a recent meeting of the board of directors of the Interstate Iron & Steel Co., Chicago, John McConnell, who has charge of alloy steel production for the company, was elected a vice-president.

George P. Dempler, general Pittsburgh manager, the Fiber Barrel Machinery & Mfg. Co., has resigned, taking effect June 30, and is accepting a position as mechanical engineer, and manager of the Valve Department, J. V. Walsh Co., Pittsburgh.

Charles F. Hauss, who was for years identified with the American Radiator Co. in Europe, during the last part of the time in Italy, is now vice-president of the Mediterranean Trading Co., Inc., with offices at 29 Broadway, New York. His son, now abroad in the army, is expected to return to Italy and take charge of the Milan office of the company.

William G. Pearce will leave the presidency of the American Brake Shoe & Foundry Co., New York, to become chairman of the executive committee. He will be succeeded by Joseph B. Terbell, vice-president, the changes taking effect July 1. Joseph D. Gallagher, former director, has been succeeded by Randolph Ortman, president of one of the company's subsidiaries.

Stone & Webster, Boston, engineers, will establish a "Societe Stone et Webster" in Paris to make investigations and reports and to execute general engineering and construction work.

C. W. Engle has resigned as chief engineer of the Central Steel Co., Massillon, O. and expects to take a rest before engaging in any other work.

S. M. Marshall of Perin & Marshall, New York, sailed on the Lapland for England, June 21, and will be absent for two months on business connected with the Tata Iron & Steel Co. and an important British steel interest. Mr. Perin, who has been in India for some time, is now on his way to London.

Frank O. Lyle, formerly chief inspector at the Remington Arms Co. plant at Hoboken, N. J., has become chief inspector of the Bijur Motor Appliance Co., same city, succeeding Paul Theis, whose going to the Charles Fischer Spring Co., Brooklyn, N. Y. was mentioned in THE IRON AGE of June 12.

Samuel F. Joor, consulting engineer, Chicago, has joined the American Steam Conveyor Corporation, Chicago, as sales engineer. Mr. Joor has had wide experience in the conveyor field, at one time being Western manager and sales engineer of the Jeffrey Mfg. Co. and previous to that, with the Link Belt Co.

Alfred Crook, vice-president and general manager Philadelphia Roll & Machine Co., and the Tioga Steel & Iron Co., Philadelphia, has returned from Europe where he has been for several months investigating foreign trade conditions in the interests of the above companies, which are subsidiaries of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., of which Mr. Crook is also a vice-president.

Frank L. Estep, for a number of years chief engineer of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and later connected in a like capacity with the Nova Scotia Steel & Coal Co., has been made a member of the firm of Perin & Marshall, consulting engineers, 2 Rector Street, New York.

A. C. James has been appointed auditor of the Sharon, Pa., plant of the American Steel Foundries, Chicago, succeeding G. S. Alston, transferred to the plant at Alliance, Ohio.

Fred Tod has been appointed assistant to George F. Alderdice, vice-president of the Brier Hill Steel Co., Youngstown, Ohio. Mr. Tod was formerly an assistant general sales manager and was recently elected a member of the board of directors.

Prof. Dexter S. Kimball has been appointed dean of the College of Engineering, Cornell University, to take effect in the fall of 1921. Action was recently taken to combine the colleges of mechanical engineering and civil engineering at Cornell, and partly in preparation for the new duties, Professor Kimball has been granted a year's leave of absence to give him an opportunity to study the engineering colleges of the country.

Franklin G. Smith, president the Cleveland Osborn Mfg. Co., Cleveland, has been elected president of the Cleveland Young Men's Christian Association. F. W. Ramsey, president Cleveland Metal Products Co., has succeeded Mr. Smith as vice-president of the association.

The Oliver Iron & Steel Co., Pittsburgh, effective Aug. 1, will maintain a Pacific Coast sales office in the Monadnock Building, San Francisco, in charge of E. W. Kratzer, who is acquainted with the wide range of products made by the company. The company requests that, commencing Aug. 1 next, all inquiries and orders and all correspondence relating thereto be addressed to its Pacific Coast office. Mr. Kratzer for some years was Pacific Coast sales agent of the American Iron & Steel Mfg. Co. until it was taken over by the Bethlehem Steel Co., but remained in the Pacific Coast sales office of the latter company as assistant to H. B. Green, sales agent, which position he resigned recently to go with the Oliver Iron & Steel Co.

Lieut. Col. Elmer K. Hiles, for more than 10 years secretary of the Engineers' Society of Western Pennsylvania, Pittsburgh, who went to France in July, 1917, in detached service, Fifteenth Engineers, largely recruited from Pittsburgh, is back in this country and has been appointed business manager of the physical and chemical laboratories maintained by the Pittsburgh Testing Laboratory in Pittsburgh and in five or six other cities. Lieut. Col. Hiles is now spending a furlough at Nantucket Beach and expects to be mustered out of service very early in July. He will assume his duties with the Pittsburgh Testing Laboratories about July 15. H. F. Trischow, who has been assistant secretary of the Engineers' Society of Western Pennsylvania for several years, has been appointed secretary, succeeding Mr. Hiles.

John A. Baker, formerly assistant general superintendent of the plant of the Mesta Machine Co., Mesta, near Pittsburgh, has resigned to accept a position with the Kroyer Mfg. Co., Stockton, Cal.

Charles L. Doyle, who during the war had charge of Connellsville coke supplies for some independent blast furnace interests, on July 1 will resume his former coal and coke interests with offices in the Oliver Building, Pittsburgh. He will represent the Oliver and Snyder coal and coke interests.

R. T. Harris has been appointed superintendent of the steel department of the Heppenstall Forge & Knife Co., Pittsburgh, which contains two 6-ton Heroult furnaces. This company is now making plans for the building of one and possibly two 25-ton basic open-hearth steel furnaces to be built under the supervision of Mr. Harris. He will have charge of the open-hearth department when it is finished. He was formerly connected with the open-hearth plants of the Indiana Steel Co., at Gary, Ind., and of the Bethlehem Steel Co., South Bethlehem, Pa., and during the war was a supervisor of steel.

Eli Joseph, Joseph Joseph & Bros. Co., iron and steel scrap, New York, sailed Saturday for Europe for a several weeks' trip for business and pleasure.

Charles W. Cullen has been appointed sales agent for the Damascus Mfg. Co., Cleveland, maker of cutting oils and grinding compounds. Mr. Cullen will make his headquarters at the Savoy Hotel, Cincinnati, and will handle southern Ohio, northern Kentucky and southern Indiana.

John A. Baker who has been in the employ of the Mesta Machine Co., Pittsburgh, for the past six years

as assistant general superintendent, has resigned to accept a position with the Kroyer Mfg. Co., Stockton, Cal.

V. Z. Caracristi has joined the Railway and Industrial Engineers, Inc., 25 Broad Street, New York, giving service in a representative, advisory, consulting, or administrative capacity.

OBITUARY

PAUL M. EINERT, aged 56, who died suddenly Tuesday, June 5, at his home at 220 West Ninety-eighth Street, New York, entered the accounting department of the Westinghouse Electric & Mfg. Co. at East Pittsburgh in 1900. Later he took charge of the accounting department of the French Westinghouse Co., Havre, France, and from there was transferred to the British Westinghouse Electric & Mfg. Co., Manchester, England. In 1910, he was appointed foreign auditor with headquarters in London. After the purchase of the controlling interest in the French and Italian companies, by the British Westinghouse Co. from the Westinghouse Electric & Mfg. Co., he returned to service with the British company as traveling auditor, later becoming assistant to the comptroller of the Westinghouse company with offices at East Pittsburgh. In January of this year, he was appointed special representative to the chairman, with offices in New York. His chief duties were in connection with foreign trade of his company.

HIRAM SWANK, founder of Hiram Swank's Sons, Johnstown, Pa., makers of fire clay refractories, died June 18 in his home there, aged 85. He established the firm 63 years ago and was the originator and the first manufacturer in this country of sleeves, nozzles and runner brick. He learned the pottery trade with his brothers, Josiah and Jacob, in 1854 the former disposing of his interest to Hiram. Later the plant was changed to one manufacturing fire clay products. In 1870 he was requested by officials of the Cambria Iron Co. to make a nozzle to replace the expensive imported ones. First he made several by hand which proved better than the imported nozzles and later he developed dies and made them by machinery.

E. J. SHERWIN, foundry expert, died suddenly on June 12 of heart failure. His entire life was devoted to the foundry business, starting at 14 years of age, and staying continuously at it until his death at the age of 70. He was a master of gray iron founding and of non-ferrous metals. At his death he was foundry superintendent of the Textile Finishing Co., Providence, R. I. Some of his previous connections were: the Platt Iron Works Co., Dayton, Ohio; Fairbanks Morse Co., Beloit; owner and builder of Enterprise Foundry Co., Muskegon, Mich.; foundry superintendent Wellman-Seaver-Morgan Co., Akron, Ohio; General Electric Co., Pittsfield, Mass.; and the Fore River Ship Building Co.

JOHN J. BRODERICK, president Broderick & Bascom Wire Rope Co., St. Louis, for more than 50 years one of the most active figures in the iron and steel industry in that city, died at a St. Louis hospital recently after an illness of several months. Mr. Broderick was 74 years old. He was born in Ireland and went to St. Louis in 1849, when he became connected with Pratt & Fox Hardware Co. For a few years before entering the wire rope manufacturing business as senior partner of the Broderick & Bascom Wire Rope Co., Mr. Broderick was connected with the Railway Supply Mfg. Co.

GEORGE ELMER WOLCOTT, the New England sales manager of the Sullivan Machinery Co., Chicago, died recently. He was born in Claremont, N. H., in 1868 and has been identified with the company since 1888. He received his last position in 1905 and had made Boston his headquarters since 1911.

JOHN G. ROHRMAN, formerly with the Pittsburgh sales force of the Youngstown Sheet & Tube Co., and subsequently district sales agent of the company in Atlanta, Ga., and who about two years ago was made Chicago sales manager of the Allegheny Steel Co., died recently at Elizabeth, Pa., following an illness of more than a year. He was a native of Philadelphia, and was about 34 years of age.

WILLIAM ANDREW BOLE, vice-president in charge of manufacturing, Westinghouse Machine Co., East Pittsburgh, died June 16. He was a member of a number of engineering societies in which he took a conspicuous part, notably the Engineers' Society of Western Pennsylvania, of which he was president in 1900; the American Foundrymen's Association, of which he was vice-president in 1910, and the American Society of Mechanical Engineers. His loss is a heavy one to the mechanical engineering profession. He was a member of the Engineers' Club of New York.

JESS T. REZNOR, president the Reznor Mfg. Co., Mercer, Pa., died at his home in that place on June 13. Mr. Reznor was educated in the schools at Mercer, and succeeded to the business of the Reznor Mfg. Co., maker of gas heating stoves, which had been organized by his father. During the war, the Government demands on his time were heavy, and he suffered a general breakdown in health.

FREDERICK ROBINSON PETTIT, vice-president and general manager J. I. Case Plow Co., Racine, Wis., died June 15 after a week's illness with pneumonia. He was 35 years of age and was graduated from the University of Chicago in 1904.

SAMUEL HOWARD WILCOX died June 13. Up to his retirement 10 years ago, he was senior director of Peck, Stow & Wilcox Co., Southington, Berlin and New York, and a manager of the store in the last named city.

LEWIS A. BECKER, Chicago, vice-president the Bishop & Babcock Co., Cleveland, until his retirement a year ago, died June 16. He was president of the L. A. Becker Co., Chicago, from about 1900 to 1911, when it was consolidated with the Bishop & Babcock Co.

MAJ. EDWARD P. REICHHELM, founder and president of E. P. Reichhelm & Co., Inc., New York, American Gas Furnace Co., and American Swiss File & Tool Co., died May 4.

JOHN H. BRODERICK, president of the Broderick & Bascom Rope Co., St. Louis, manufacturer of wire rope and cable, died June 7.

FRANK C. LAMARCHE, general superintendent Chicago Shipbuilding Co., died at his home in Chicago on June 14, following a cerebral hemorrhage.

Colonel Lamont Honored

Col. Robert P. Lamont, president American Steel Foundries, Chicago, has been awarded the distinguished service medal by order of the President for service in connection with the war. The citations were made public on June 12. Colonel Lamont was awarded the medal for work in the Ordnance Department, described in the official announcement as "exceptionally meritorious and conspicuous service as assistant to the chief of Procurement Division, later as chief of the Procurement Division, and as a member of the Claims Board of the Ordnance Department," where he "rendered material assistance to the nation's industry in adjusting equitably outstanding contracts with full justice to employers and employees alike."

Large Reservations for Foundry Exhibit

The reservations of space up to June 20 for the exhibit in connection with the convention of the American Foundrymen's Association at Philadelphia, Sept. 30 to Oct. 3, represented a greater total than was used at any previous exhibit with the exception of the first Chicago exhibit in 1913, and there seems little doubt that that will be exceeded before many weeks. Philadelphia committees are already well organized for the September convention and the prospects are that in a number of particulars it will make a new record.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
June	Lake	lytic	York	York	Louis	York	Louis
18	18.12½	17.87½	72.50	5.35	5.10	6.90	6.55
19	18.00	17.75	72.50	5.35	5.10	6.90	6.55
20	18.00	17.75	72.50	5.35	5.10	6.95	6.60
21	18.25	18.00	....	5.35	5.10	6.95	6.60
23	18.37½	18.12½	71.00	5.37½	5.12½	7.25	6.90
24	18.50	18.25	70.00	5.40	5.15	7.35	7.00

NEW YORK, June 24.

The markets are all strong but only moderately active. Copper is nominally higher but demand is light. The tin market is again practically an open one but buying is very light. The lead market is inactive but steady. Spelter has been very active and has advanced decidedly. Antimony is inactive but steady.

New York

Copper.—The market is dull but extremely strong, and prices are nominally higher. All large producers to-day quote electrolytic at 18.25c., New York, for June-July delivery, with future positions about ¼c. higher. Very little business is being done, however, although the metal has sold at the level quoted. Quotations are nominal because producers are disinclined to press the market as they expect higher levels with the signing of peace and a better demand both for export and domestic use. Labor troubles in the brass industry have also had some effect in retarding the placing of orders. Looking into the future producers expect that it will be difficult to increase their output to 100 per cent capacity or perhaps 75 per cent. It is now about 50 per cent of capacity. It is expected that it will be difficult to obtain labor and that as a result, as demand quickens, the metal will grow scarcer and prices rise. Lake copper is difficult to buy for July delivery and is nominally strong at 18.50c., New York, for July delivery. It is believed that the large stocks of copper in the country have been considerably reduced in the last four to six weeks.

Tin.—Again two important further announcements have appeared in the last week materially affecting the American tin trade. George Armsby, chief in charge of tin, announced on June 23 that all the allocated tin had been disposed of and also that all restrictions on trading in the metal between consumers, dealers, jobbers and smelters are immediately discontinued. The market, therefore, so far as the confines of the United States are concerned is now an entirely open one. Already some consumers having large stocks of Straits tin have offered some of it for sale and some has changed hands as low as 70c., New York, which we quote as the market for spot Straits tin. The American Iron and Steel Institute will continue to function until such time as all import restrictions are removed and also will be in a position to negotiate between consumers who have large stocks of tin and those who have not and desire to obtain tin. The announcements have not surprised the trade, as this action was expected by July 1 at the latest. The market is very quiet, and disappointingly so to the trade because the situation has been so rapidly clearing up. An interesting opinion as to the future of the market for Straits tin is to the effect that it will be to the advantage of consumers having large stocks to sell their tin, as some have already done, under the former fixed price of 72.50c., and buy tin for future July or August shipment at the present price of 51.50c. to 52.50c. because by so doing a profit will accrue through such a transaction. Import licenses have already been granted for July shipment of Straits tin from the East and a little business has been done at 51c. to 52c. Banca tin is quoted at about ½c. per lb. under Straits. American smelters are quoting pure tin on a par with Straits tin at 70c., New York.

Lead.—The market is firmer, but very quiet, and the outside market has returned to a level with the Trust price, which is 5.40c., New York, or 5.15c., St. Louis. Demand is only fair but the situation is considered strong and it is reported that some business in the outside market has been done at 5.45c., New York. Some go so far as to say they expect an advance in the price of the leading interest in the near future.

Spelter.—Late last week and early this week a decided demand appeared from galvanizers and other consumers, and, after the week-end, quotations took a decided jump, until to-day prime Western for July delivery was quoted at 7c., St. Louis, or 7.35c., New York, or an advance of nearly ½c. in the week. It is reported that there has been some very heavy buying, particularly by galvanizers, and also that there is a substantial amount of export inquiry, one alone amounting to 500 tons.

Antimony.—The market is quiet, with wholesale lots for early delivery quoted at 8.37½c. to 8.50c., New York, duty paid, for Asiatic grades. It is understood that small lots can be obtained as low as 8.25c., New York.

Aluminum.—The market for No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 33c., New York, for wholesale lots for early delivery.

Old Metals.—The market is firm. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	17.50
Copper, heavy and wire	16.50
Copper, light and bottoms	14.25
Brass, heavy	12.00
Brass, light	8.75
Heavy machine composition	16.75
No. 1 yellow rod brass turnings	9.50
No. 1 red brass or composition turnings	14.00
Lead, heavy	5.00
Lead, tea	4.25
Zinc	5.00

St. Louis

ST. LOUIS, June 23—The markets have been quiet during the week, but prices have been steady, closing to-day as follows: Lead, 5.15c., car lots; spelter, 6.70c., car lots. In less than car lots the quotations were 5.50c. for lead, with spelter, 7.25c.; tin, 72.50c.; copper, 18.50c.; antimony, 9.50c. In the Joplin ore district prices were firm during the week with some sales $1 higher than in the preceding week, putting zinc blends, basis 60 per cent, at $43; calamine, basis 40 per cent, $25 to $28, and lead $56 per ton. In miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7c.; heavy yellow brass, 9c.; heavy red brass, 13.50c.; heavy copper and copper wire, 13.50c.; light copper, 11c.; pewter, 35c.; tinfoil, 44c.; tea lead, 3c.; zinc, 3.50c.; lead, 4c.

Chicago

CHICAGO, June 23.—Copper has been less active although the aggregate amount of business done during the week was considerable. In tin there has been some buying at about 52c. for shipment in August, September and October. Lead is very quiet but strong. The price of spelter continues firm but there is little buying. There has been no change in antimony. Some grades of old copper and brass have advanced again. We quote copper at 18c. to 18.25c. for carloads; tin, 72.50c.; lead, 5.15c. to 5.25c.; spelter, 6.75c.; antimony, 9.50c. to 10c. On old metals we quote copper wire, crucible shapes, 14.75c.; copper clips, 14.25c.; copper bottoms, 12.50c.; red brass, 14.50c.; yellow brass, 9.25c.; lead pipe, 4c.; zinc, 4c.; pewter, No. 1, 35c.; tinfoil, 37c., and block tin, 50c., all these being buying prices for less than carload lots.

Under a recent decision of the Ohio State Tax Commission, corporations in that State must file copies of their balance sheeets with tax returns. The new ruling affects hundreds of corporations large and small doing business in that State, among them being some of the principal steel companies incorporated in Ohio and other States.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

The prices below are based on those announced at Washington by the Industrial Board on March 20, 1919, effective the following day, which since that date have largely governed market transactions, though there have been variations, as indicated in market reports on other pages.

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; mimimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00; galvanized wire, $3.70; galvanized barbed wire and fence staples, $4.10; painted barbed wire, $3.40; polished fence staples, $3.40; cement-coated nails, $2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.70 base
Large boiler rivets.....$3.80
¼ in., 5/16 in. and 7/16 in. diam..65-10 and 5 per cent off list
Machine bolts, h.p. nuts, ⅝ in. x 4 in.:
Smaller and shorter, rolled threads..60-10-5 per cent off list
Cut threads.....60-5 per cent off list
Larger and longer sizes.....50-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....45-10-10 per cent off list
Larger and longer.....40-10-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....60-5 per cent off list
Cut threads.....50-10-5 per cent off list
Larger and longer sizes.....45-10 per cent off list
Lag bolts.....65-5 per cent off list
Plow bolts, Nos. 1, 2, 3.....60 per cent off list
Hot pressed nuts, sq. blank.....3.25c. per lb. off list
Hot pressed nuts, hex., blank.....3.25c. per lb. off list
Hot pressed nuts, sq. tapped.....3c. per lb. off list
Hot pressed nuts, hex., tapped.....3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....3c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....70-10 per cent off list
9/16 in. and smaller.....80 per cent off list
Stove bolts in packages.....75-10-10-5 per cent off list
Stove bolts, in bulk.....2½ per cent extra
Tire bolts.....60-10-10-5 per cent off list
The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common, basic or Bessemer rods to domestic consumers, $52; chain rods, $60; screw, rivet and bolt rods and other rods of that character, $60. Prices on high carbon rods are irregular. They range from $65 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., $3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 per 100 lb. in carload lots of 200 kegs or more, and $4.90 in small lots. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.35c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅛ and ¼	29½	2½
½	54½	40	⅜	30½	3½
¾ to 3	57½	44	½	34½	16½
			¾ to 1½	39	23½

Lap Weld

2	50½	38	1¼	24½	9½
2½ to 6	53½	41	1½	31½	17½
7 to 12	50½	37	2	32½	18½
13 and 14	41	..	2½ to 6	34½	21½
15	38½	..	7 to 12	31½	18½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛, ¼ and ⅜	28½	11½
½	51½	39	½	33½	20½
¾ to 1½	55½	43	¾ to 1½	39½	24½
2 to 3	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	25½	10½
2½ to 4	51½	40	1½	31½	17½
4½ to 6	50½	39	2	33½	20½
7 to 8	46½	33	2½ to 4	35½	23½
9 to 12	41½	28	4½ to 6	34½	22½
			7 to 8	26½	14½
			9 to 12	21½	9½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	3½ to 4½ in.	—16
2½ to 3¼ in.	30½	3 to 3¼ in.	— 1½
2¼ in.	24	2½ to 2¾ in.	+ 1
1¾ to 2 in.	19½	2 to 2¼ in.	+10
		1¾ to 1⅞ in.	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15
Nos. 22 to 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70
Nos. 12 and 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 to 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

A Notable Year for the Testing Society

Early Sessions of the Annual Gatherings at Atlantic City Focus Attention on the Development of Magnetic Analysis

ATLANTIC CITY, N. J., June 24.—The annual meeting of the American Society for Testing Materials now in progress at the Hotel Traymore marks the end of a year in which there have been notable activit.es among various standing committees of the society. This fact was brought out not merely in the annual report of the executive committee submitted at the first session this morning, but bids fair to be further emphasized when the individual reports are considered at later sessions. Conspicuous in the meeting's program stands a discussion on magnetic analysis.

Membership and Publications at High Point

The executive committee's report gave an admirable summarization of the year's work between conventions. The membership at the last annual meeting was 2261. Since then 391 applications for membership have been approved as compared with 269 during the previous year. Deaths, resignations and other losses numbered 171, leaving a net increase for the year of 220. The total membership of the society is now 2481, including 261 junior members.

The regular publications issued in the year are the largest in volume in the history of the society. The proceedings contain 1244 pages, the book of A. S. T. M. standards 908 pages, and the membership pamphlet 297 pages, making a total of 2449 pages.

One new committee, committee A-8 on magnetic analysis, was created. The recommendations of the standing committees affecting standards include a tentative revision by committee A-1 on steel, for open-hearth steel girder and high tee rails, and by committee A-2 on wrought iron, for engine bolt iron. Tentative standards were recommended for adoption by committee A-7 on malleable castings. The recommendations by committee B-2 on non-ferrous metals and alloys include those for cartridge brass, cartridge brass disks, naval brass rods for structural purposes, methods for chemical analysis of manganese bronze, and methods for chemical analysis of gun metal.

New Standards Proposed

Proposed new tentative standards have been recommended by committee A-1 on steel, for plates for forge welding; by committee A-2 on wrought iron, for extra refined wrought-iron bars; by committee B-1 on copper wire, for tinned soft or annealed copper wire for rubber insulation; by committee B-2 on non-ferrous metals and alloys, for brass ingot metal for sand castings, for bronze bearing metal in ingot form, for lead, for solder metal, method for battery assay of copper and method for chemical analysis of pig lead. Committee B-2 recommends the continuance as tentative standards those for aluminum ingots, for aluminum sheet, and for light aluminum casting alloys.

The surplus of the society was increased in 1918 from $11,955.53 to $14,284.04. The disbursements for publications were $21,714.48, for salaries $9,870, and for expenses of delegate to International Aircraft Conference in London $1,865.03. An investment was made in $5,000 of Liberty bonds. The total disbursements were $42,521.75.

Reference is made in the report to the appointment of three representatives of the society to act on the American Engineering Standards Committee, Past Presidents A. A. Stevenson and A. W. Gibbs and J. A. Capp. This committee has already adopted as tentative standards two A. S. T. M. standards: those covering specifications and tests for Portland cement and specifications for fire tests for materials of construction. The society has taken membership in Engineering Council, its representative being Albert Ladd Colby. An important activity of Engineering Council is the maintenance of a national service committee with headquarters at Washington.

Activities with Other Societies

Considerable emphasis was given in the report to the joint activities with other societies. A. A. Stevenson represented the society on the engineering division of the National Research Council. F. M. Farmer, Electrical Testing Laboratories, New York, was appointed as the society's representative on the American Bureau of Welding. Committee A-1 on steel has co-operated with the American Railway Engineering Association's track committee looking in part to the revision of carbon steel rail specifications. This same committee has had under consideration the standardization of specifications for aircraft steels in co-operation probably with the Society of Automotive Engineers. On the invitation of the United States Government Dr. John A. Matthews, president Halcomb Steel Co., was appointed to represent the society on a national technical committee which in turn would represent this country at a conference in Paris of the International Aircraft Standards Commission. Although this conference was scheduled to take place in June, it appears probable that a special act of Congress may be necessary to give the committee legal right to represent the United States. At the suggestion of Dr. Richard Moldenke it was decided to request some such technical body as the American Foundrymen's Association, the Patternmakers' Association or the Steel Founders' Society to consider the desirability of standardizing core prints, pattern colors, allowances in castings for positions of holes, etc., the understanding being that the American Society for Testing Materials will co-operate in so far as questions of materials may enter. Under the agreement with the United States Department of Commerce 62 standard specifications of the society have been printed in an English-Spanish edition, particularly for distribution in South American countries. The executive committee is considering establishing headquarters in the building now used as the Engineers' Club of Philadelphia, 1315 Spruce Street, that city.

M. O. Leighton, chairman national service committee of Engineering Council, was unable to be present, but a paper from him was read. H. E. Howe of the National Research Council also addressed the meeting covering the work of industrial co-operative research. The registration at this writing is 325.

The report of committee E-4 on magnification scales for micrographs, W. H. Bassett, technical superintendent American Brass Co., Waterbury, Conn., chairman, offered a number of amendments to its last report. It recommends this, for example, for general use in society reports and for showing grain size, 100 magnifications for steel and various metals, and 50 and 100 in the case of cast copper and 75 in the case of wrought copper.

The report of committee D-1 on preservative coatings for structural materials indicated that further exposure of one or two years will be required of the test panels at Altoona and Brooklyn before the conclusions can be properly derived from the tests. One of the subcommittees submitted a list of terms to be used in reporting the service condition of painted surfaces. The standardization of terms is aimed at, securing a uniformity and precision in describing the character and amount of disintegration of paint coats so that reports of different investigators or observers may be intelligently or accurately compared. A system of rating, for example, is provided to cover checking and definitions are supplied for flaking, scaling, blistering, peeling, etc.

In the evening following the presentation of the address by the president, a memorial session was held in honor of Dr. Edgar Marburg, who was secretary-treasurer from 1902 until his death on June 27, 1918, at the time of the last annual meeting.

Addresses were made on the life and life work of Professor Marburg by John M. Goodell, formerly editor *Engineering Record*, who devoted himself to Dr. Marburg "As An Engineer;" by Robert W. Lesley, Philadelphia, on "Early Activities in the Society;" Prof. Arthur N. Talbot, University of Illinois, on "Recent Activities in the Society;" and Capt. Robert W. Hunt, Chicago, the title of whose address was "A Personal Tribute."

Officers Elected

The following officers were elected for the ensuing fiscal year:

For president, J. A. Capp, chief testing laboratory, General Electric Co., Schenectady.

For vice-president, C. D. Young, spuerintendent motive power, Philadelphia, Baltimore & Washington Railroad, Wilmington, Del.

For members of executive committee, Ernest Ashton, H. F. Moore, C. F. W. Rys and Admiral D. W. Taylor.

Meeting of the American Boiler Manufacturers

The thirty-first annual convention of the American Boiler Manufacturers' Association was held at Buffalo, June 23 and 24, with headquarters at the Lafayette Hotel, and was called to order by the President W. C. Connelly of the D. Connelly Boiler Co., Cleveland, who made the opening address.

E. R. Fish and Charles E. Gorton outlined the work of the American Uniform Boiler Law Society at the opening session and Mr. Fish announced that the amount of funds allotted for the use of that society had been raised. The Standardization of Steam Pressures for Water Tube Boilers and Fire Tube Boilers was discussed and also questions regarding the proper design of various types of boilers.

The annual banquet was held Tuesday evening at the Lafayette Hotel.

National Retail Hardware Association Meets at Pittsburgh

The twentieth annual convention of the National Retail Hardware Association, having a membership of 15,000 and doing business in 40 states, opened in the William Penn Hotel, Pittsburgh, on Tuesday, June 24, to continue until, and including, Friday. Many important subjects will be discussed, and delegates from the various states are expected to report on going activities and give the convention the benefit of their judgment as representatives of the hardware merchants of their states. Officers of the association are: M. D. Hussie, Omaha, Neb., president; J. M. Campbell, Bowling Green, Mo., vice-president; Milo J. Thomas, Corunna, Ind., treasurer; Herbert P. Sheets, Argos, Ind., secretary.

What is said to be the largest outdoor sign ever constructed was recently completed for the Clark Equipment Co., manufacturers of high speed drills and precision tools, at its Buchanan, Mich., plant. It is located on the Michigan Central Railroad 86 miles east of Chicago, and is visible for more than a mile in either direction, night as well as day, being illuminated by twelve 750-watt nitrogen lamps. It has an area of 6480 sq. ft., its dimensions being 190 ft. long and 40 ft at its highest elevation.

The Ludlum Steel Co., Watervliet, N. Y., has opened an office at 521 Park Building, Pittsburgh, and the Pittsburgh district business will be handled by J. E. Polhemus, manager, and George Agerter, assistant manager. Mr. Polhemus was formerly in the metallurgical department of the Westinghouse Air Brake Co., and before going with the Ludlum Steel Co., Mr. Agerter was with the Hunter Saw & Machine Co. and the Pittsburgh Saw & Mfg. Co.

GERMAN STEEL INDUSTRY

Post-Bellum Plans for Acting With Aid of the Government

WASHINGTON, June 24.—The Bureau of Foreign and Domestic Commerce has published some interesting details concerning the "German Steel Men's League", translated from the "Economisch-Statistische Berichten" of Essen. It points out that care must be taken not to confuse this organization, which bears the German name of "Deutscher Stahlbund" with the Steel Association (Stahlwerksverband), although both have their headquarters at Duesseldorf. The Stahlwerksverband is a member of the Deutscher Stahlbund.

"Even before the war," says the article quoted, "the plan was to unify the entire German iron and steel industry into one great body, the Deutscher Stahlbund, because the Stahlwerksverband existed only for semi-manufactured steel, railroad material, structural iron and bar manufactures, and for other iron and steel products there were separate syndicates, conventions, associations, etc. In May, 1915, a constitution was presented for this body, but it has never come to the point of discussion.

"In point of fact, however, the body existed, but only in a provisional form. The German Government used this Stahlbund during the war period as the distributing agency for iron and steel. Now the war has ended, quite differently from what many thought, and another Government has stepped to the helm, therefore, quite a different direction has been given to the interets of the iron and steel industry. However, it is necessary for the economic rehabilitation of the country that a careful use shall be made of all of its resources. Accordingly, the Ministry for Economic Affairs established in the interim has considered all kinds of problems, quite in connection with the socialistic spirit that is permeating everything.

"The old Stahlwerksverband never came up to the expectations that were entertained of it, as a consequence of the conflicting interests of the members, and partly of the evident impossibility of including other products of the iron industry. During the war it was 'provisionally' extended under the pressure of the times for half a year, and was to expire June 30, 1919; so that by May 1 it must either be prolonged or otherwise go out of existence. It has accordingly been extended quite in its old form, but only until Sept. 30, 1919, that is, provisionally for three months longer, again in order to prevent the members from starting a war of competition. Such a struggle, especially in a time like the present, would have ruined the steel business, an important branch of the national industry; and German industry with all the other prejudicial conditions it has to face, has much to suffer.

"The Stahlwerksverband is, and remains provisionally, a body that has to do only with the production and sale of the semi-manufactured steel, railroad material, structural iron, and beams of its members. There are no outsiders.

"With a view to the renewal of the organization of the German steel and iron industry, the present Government has expressed to the manufacturers its wish to unite in a blanket syndicate the Stahlwerksverband and the Crude Iron Syndicate, and as a model has suggested the projected Deutscher Stahlbund . . . . In a short time, the first meeting will take place."

Mexican Plant's Plans

WASHINGTON, June 24—Vice Consul Thomas Dickinson at Monterey has reported to the Department of Commerce that during the week beginning May 26 the steel plant located at Monterey, the largest establishment of its kind in Mexico, would renew operations at its full capacity manufacturing steel rails, structural steel, commercial iron and kindred articles. For the last six months the plant has been operating on a very small scale, owing to lack of coke and other obstacles. The plant is owned by Spanish and Mexican capital.

OCEAN FREIGHTS HALT TRADE

England Supplying Italy and Later Germany May Furnish Coke and Iron

Judging from statements made in letters from Italy addressed to a New York trading company having connections in that country, there is not much prospect of any extensive business in iron and steel with the Italians until ocean freights are sharply reduced. Aside from the high level of transatlantic freight rates, shippers who would get goods to Italy are confronted also by what they term high prices here and the high rate of Italian exchange, while another detriment to trade in that direction is that European countries purchase Italy's fruits, flowers, vegetables and wines, an incentive for Italy to deal with them because she can give, to a considerable extent, her produce instead of money for what she requires.

The writer sums up by saying that the Italian pig-iron market is saturated at this time and that freight rates must be materially reduced if American products are to compete against stocks of iron, scrap and sheets now said to be existant in Lorraine, Germany, etc. England, on the other hand, is short of both iron and coal, but she is nevertheless able to undersell America. It is understood that the Italian Government has a supply of American coal, but is asking more than $5 a ton for it over the price at which English coal can be obtained.

One Italian company writes to its New York correspondent that "it is only the high price of freight that puts American industry in a position of inferiority," and goes on to say there is little opportunity for American pig iron or coal at this time. According to this authority the Italian Government has quite lately furnished American pig iron at 320 lire, or $40 per ton, on board cars, Genoa, duty paid, the iron coming from 20,000 to 30,000 tons contracted for during the war. Lately there have been offerings in Italy of Luxemburg iron at 380 to 400 lire, or $47.50 to $50; Middlesboro at 400 to 420 lire, or $50 to $52.50, and C. E. Hematite at 500 to 550 lire, or $62.50 to $68.75, all these prices being for iron aboard cars. The Italian Government, on the other hand, has offered hematite at $40 per ton, and scrap cast-iron or steel shells at $31.25. It is reported that thousands of tons of this latter material are going to the foundries and steel works. Pointed to as a probable deterrent to future business are great stocks of scrap in France, Germany and Austria.

Steam coal was recently offered at $32, c.i.f., Genoa, where 500 tons per day was being unloaded. At last advices consumers were awaiting new English prices, which were expected to be below those for American coal. American coke, it is stated by the writer of the letter, is not liked, English or National being preferred, the latter being supplied by the Government at $32.50 per ton, on cars. The significant statement is made that the Italians hope to get Westphalian coke after peace articles are signed.

A leading American interest has offered foundry iron to Italy at $56.75, c.i.f., a price declared to be predicated either on special freight rates or to transporting the iron as ballast in cotton carrying ships that go to Genoa. Steel scrap has been offered in Italy at $60 per ton, but found no takers because of the abundance of war scrap.

Italy has an import duty on pig iron of $1.25 (10 lire) per quintal, plus 50 per cent for gold equivalent, while the unloading cost ranges from $1.25 to $1.87½.

Sharon Steel Mfg. Co. Formed

Pittsburgh and Sharon business men have purchased the site and buildings of the Blaw-Knox Co., Wheatland, Pa., and have formed the Sharon Steel Mfg. Co. The company will engage in the manufacture of steel plate and special forgings, similar to the Blaw-Knox products. Temporary offices will be opened shortly in Sharon, Pa. A short time ago the Blaw-Knox Co. announced its intention of moving its Wheatland plant to Hoboken, N. J., where it has large interests. Work of dismantling is well under way. Interests behind the new steel company are E. E. Slick, Johnstown, Pa., formerly vice-president of the Midvale Steel & Ordnance Co.; L. L. Knox, Pittsburgh, and C. K. Strausbaugh, William McIntyre, George W. Short, P. R. Cachman and A. R. McGill of Sharon.

In connection with the sale of its Wheatland plant, the Blaw-Knox Co. states this is in line with the program which it outlined some time since, for either the removal or sale of the Wheatland plant and the building of an extension to its plant at Hoboken, Pa. to take care of products formerly manufactured at Wheatland. This is being done for the purpose of concentrating all manufacturing at Hoboken, which has been found an advantageous point for manufacturing and shipping facilities. About half the new plant at Hoboken has been completed, and it is anticipated the entire addition will be finished within the next few weeks. The combined plants at Hoboken now under construction, will contain about 30 per cent more floor space than was available in the two separate plants. The capacity of the enlarged plant at Hoboken for the manufacture of its products will be proportionately increased. In addition to the above, the Blaw-Knox Co. is building a welding plant at Hoboken adjoining its present plant, and will specialize in this department on steel mill and chemical plant specialties. The combined plants at Hoboken will employ about 1200 men as against 700 men employed by the company heretofore at Hoboken and Wheatland. The manufacturing site at Hoboken covers 50 acres, and in point of shipping facilities for incoming material and outgoing product, as well as in the matter of labor supply, is well situated. In order to take care of the additional labor required, the company has purchased 15 acres of additional ground, on which houses are being erected for the use of its workmen. The entire community at Hoboken within the region of the Blaw-Knox Co. plant, presents a scene of energy and activity that gives strong evidence of the confidence of the company as to the future of business.

Foundries to Be Merged

The Iron Products Corporation, New York, recently incorporated in Delaware with capital of $3,000,000, has established offices at 90 West Street. Plans have been perfected for the merger of the Essex Foundry, Murray Street, Newark, N. J., and the Central Foundry Co., with works at Newark, Baltimore, Medina, N. Y.; Vincennes, Ind.; Anniston, Bessemer and Holt, Ala. with the new company. The Essex Foundry has specialized in the manufacture of cast-iron pipe steam and flange fittings and kindred products, while the Central Foundry Co. has been producing similar pipe products, cast-iron fittings and general castings. It is proposed to arrange for an immediate operating capital of $1,000,000. Mr. Harder, head of the Essex Foundry, will become president of the corporation; Bayard H. Faulkner is secretary.

Contracts for Steel Towboats

ST. LOUIS, June 24.—Contracts for the construction of four steel towboats for operation on the upper Mississippi River were awarded last week to the St. Louis Boat & Engineering Co., the Marietta Mfg. Co., Point Pleasant, W. Va., and the Minneapolis Steel & Machinery Co., whose combined bid of $322,500 per towboat was the lowest of the five bids submitted. The boats will be of 2000 hp., stern wheel type, drawing 4 ft. of water, and will be used to propel 19 barges. Delivery of the first boat is required May 1, 1920.

The I. M. Jacobson & Sons Co., Detroit, has placed its Eastern representation with Connolly Bros., No. 97 Warren Street, New York. It is opening a branch and intends carrying a stock of Motex anti-friction Babbitt metals in New York to take care of the Eastern trade and export business.

GETS LARGE FRENCH CONTRACT

Vulcan Steel Products Co., with Two Other Concerns, to Rebuild Nancy Region

The Vulcan Steel Products Co., 136 Liberty Street, New York, it is announced, has been awarded the general contract for construction work in the Nancy region of France, involving between $200,000,000 and $300,000,000. The McClintic-Marshall Co., Pittsburgh, steel fabricator, and MacCarthy Brothers, general contractors, Chicago and New York, will cooperate with the Vulcan Steel Products Co. in this work. A large part of the steel and other building materials and equipment will be bought in the United States. In the destroyed area were many industrial plants which will be replaced.

Negotiations preliminary to the closing of this contract were carried on by the Paris office of the Vulcan Steel Products Co. and the contracts were signed by R. D. Chipp, general manager, who has recently returned to the New York office from France.

The financing will be arranged through American banks. It is stated that the work may be temporarily held up awaiting a more favorable rate of exchange. The contract specifies that work is to be begun as soon after the signing of the peace treaty as is practicable.

Government Supplies of Cupro-Nickel

WASHINGTON, June 24—The War Department, through the Director of Sales, is making inquiries designed to develop a market, other than that afforded by the United States Mint, for approximately 75 carloads of cupro-nickel, the material from which the five-cent piece is coined. This material was acquired by the War Department to be used in the making of metal jackets that encased the 0.30 caliber bullets and other small arms ammunition. The alloy obtained for military purposes has a slightly higher copper content than that used for coinage. It consists of 85 per cent of copper and 15 per cent of nickel. The cupro-nickel is stronger than brass, and notwithstanding the presence of copper in its composition takes and maintains through long usage a natural nickel finish. Experiments have demonstrated that this alloy has an advantage over nickel-plated brass in that it holds its nickel finish. Therefore the office of Director of Sales, says an announcement of the War Department, is calling the attention of the manufacturers of automobile accessories, cutlery, builders' hardware, jewelry, pipe fittings and other nickel-plated commodities, and inviting suggestions from them as to new uses to which the metal may be put. The present surplus of cupro-nickel held by the War Department consists of the following quantities: 68 tons cupro-nickel bars (for rolling or for casting), 598 tons cupro-nickel sheets (from which the jackets are extruded); 805 tons cupro-nickel sheets in coils; 623 tons partly finished bullet jackets; 356 tons cupro-nickel scrap resulting from operations; 10 tons finished jackets.

The sheets and coils are adaptable for use by stamping mills. The bars, partly finished jackets and finished jackets are suitable for casting.

May Build More Sheet Mills

The Inland Steel Co. is considering the erection of 24 additional sheet mills at its Indiana Harbor (Ind.) plant. Of this number, it is planned to build 16 at first and eight mills later. Part of the new facilities, if provided, will be used for the production of highly finished sheets for automobile and similar uses. The company is also investigating the subject of cold-rolled strip steel with the idea of constructing a mill if such an undertaking seems advisable. It is also possible that equipment will be installed by the company for the rolling of rails.

SHORT TRADE ITEMS

Organization of the Newton Steel Co., capitalized at $3,000,000, which will build a sheet steel plant at Newton Falls, Trumbull County, Ohio, has been completed by election of officers and directors. Directors are Edward F. Clark, John W. Ford, Harold A. Taylor, J. H. Fitch, W. H. B. Ward, H. M. Steele, and George T. Fillius. Officers are: President, Edward F. Clark; vice-president, H. M. Steele; secretary-treasurer, J. H. Fitch. All three were officially connected with the Liberty Steel Co., which will be taken over July 1 by the Trumbull Steel Co. A site has been obtained, trackage rights secured and contracts let for buildings. The company expects to begin manufacturing steel by April 1, 1920.

In the House at Washington a bill has been introduced to pay the McClintic-Marshall Co., Pittsburgh, $740,000 due the company for work done on the Panama Canal in 1912 and 1913. This claim, which has been investigated by the Sixty-third and Sixty-fifth Congresses, failed both times. The amount in question was brought about by changes in plans and specifications for lock gates and other work on the canal, for which the company had a contract. Gen. George W. Goethals, builder of the canal, investigated the claims of the company and found them just.

The Monash line of pressure reducing valves and pump governors, formerly manufactured by the Monash-Younker Co., New York and Chicago, has been acquired by the Harrison Safety Boiler Works, Philadelphia. The purchase includes a stock of manufactured parts and valves, drawings, patterns, trade mark, and good will. The Harrison Safety Boiler Works will manufacture and market the valves under the trade name Cochrane-Monash.

The first improvement to be made at the DeForest works, the sheet mill plant at Niles, Ohio, recently acquired by the Republic Iron & Steel Co. from the DeForest Sheet & Tinplate Co., is the substitution of electric for steam power. The DeForest works will shut down July 1 for several weeks, when the change will be made. One motor will be installed to drive the plant, instead of an independent motor attached to each machine.

It is announced that negotiations to secure the establishment of a plant at Ashbridges Bay, Toronto, Ont., by Baldwins, Ltd., of Swansea, Wales, have proved successful. As a result the company will take over the plant and site of the British Forgings and will establish a steel plate rolling mill at a cost of upward of $2,000,000 and employ in the initial stages at least 2000 men.

The Universal Steel Co., Pittsburgh, has been chartered under Pennsylvania laws with a capital of $3,000,000 to take over the Universal Rolling Mill Co., Bridgeville, Pa., capitalized at $300,000. The company has also acquired assets of the Hussey-Binns Shovel Co., with plant at Charleroi, Pa.

J. H. Williams & Co., Brooklyn, manufacturers of drop-forgings and drop-forged tools, have added turning tools of set screw pattern with right and left-hand offset and straight shanks to their line of tool holders. The nose of the holders or shanks is beveled to permit their convenient use in close quarters.

A contract has been awarded for seven single and four double dwelling houses, for the Stanley Works, New Britain, Conn. A firm of landscape architects has been engaged to lay out and construct the road work to make the home surroundings attractive.

The Cooper-Hewitt Electric Co., 730 Grand St., Hoboken, N. J., manufacturer of electric lighting systems and other equipment, has been acquired by the General Electric Co., through stock purchase.

OCEAN RATES LOWERED

Pig Iron and Non-Ferrous Metals Included in Reductions

WASHINGTON, June 24.—Increase in shipping facilities, with its consequent cleaning up of port congestions, has induced the United States Shipping Board to make material reductions in steel rates to secure the heavyweight cargoes needed to "stiffen" cargoes of lighter commodities.

The Railroad Administration has also reported on the betterment in harbor conditions, announcing that at New York the terminal situation is in excellent condition. The French, says the report, have 19 vessels in port and the British have 11. "The British program for July," continues the report, "contemplates the picking up from ground storage of all billets now at seaboard at all North Atlantic ports. The Italian Government has seven steamers in port and expects to have six additional steamers within a few days."

The following are the iron and steel rates from United States North Atlantic ports to United Kingdom ports, quoted by the Shipping Board, per gross ton:

Bars, black	$17	Rods, wire, iron or steel	$17
Barytes	17	Scrap iron	16
Boiler tubes	17	Spelter	18
Bolts and nuts	17	Steel billets	17
Car wheels, loose	16	Steel, cold rolled in boxes	17
Copper, ingots	18	Steel hoops, in coils	17
Forgings	17	Steel rails, light, not over 30 ft. in length	17
Lead billets	18	Tin	18
Pig iron	16	Tubing, iron or steel	17
Pipe fittings, iron	17	Wire, in coils or bbl	17
Piping, iron or steel	17		

At the same time, a new schedule of rates has been put into effect to cover shipping to Danish and Swedish ports, with special quotations for steel, spelter and pig iron, for cargo stiffening, subject to special agreement, on a basis of about 20 to 25 per cent of the ships' deadweight capacity.

L. B. Foster Co. Acquires the Light Railway Equipment Co.

The Light Railway Eqiupment Co., which has been in business for some years, has recently been acquired, and is now a subsidiary of the L. B. Foster Co., Park Building, Pittsburgh, large dealer in rails. The first named company has recently completed at Holmes, near Philadelphia, a new plant containing modern equipment. The company specializes in light rails, frogs, switches, portable and industrial track, turntables, dump cars, flat cars, coal charging cars and any special design of industrial car. It acts as consulting engineer, studying transportation installations in industrial plants, and designs and furnishes complete, industrial track installations with suitable cars. The manufacturing end is in the hands of H. A. Ellis, who has been prominently connected with the construction of industrial cars. The sales end is managed by B. H. Behrens, who has been connected with the Koppel Co. for about 20 years. The general sales offices are in the Park Building, Pittsburgh, and branch sales offices are located in the Commercial Trust Building, Philadelphia, and the Tribune Building, 154 Nassau Street, New York.

More Blast Furnaces Being Blown In

YOUNGSTOWN, OHIO, June 24.—Two additional blast furnaces were blown in during the past week, No. 2 at Hubbard of the Youngstown Sheet & Tube Co. and No. 2 at Haselton of the Republic Iron & Steel Co. The Sheet & Tube company now has all of its six stacks producing metal for its finishing mills and for stock, in anticipation of maximum operations this fall. Valley operations this week are reported from 80 to 90 per cent of capacity. The Sheet & Tube company is operating both blooming mills, the 84-in. plate mill, the 9 and 12-in. mills, 12 sheet mills, three skelp mills and nine tube mills. The Republic Iron & Steel Co. is operating the Brown-Bonnell works in full with exception of two mills. Commencing July 1, the Republic plants in this city will close for a week for overhauling. Other district plants are operating close to normal. Production is curtailed, however, because of the intense heat, the thermometer mounting to 98. Sheet and tin mill operators especially have suffered, as well as workers in open-hearth departments. In a number of cases sheet mill crews have "knocked off" at noon because of the humidity.

The New Castle and Shenango works of the American Sheet & Tinplate Co. at New Castle, Pa., will not close in July, as has been customary, but will continue to roll black plate. Five additional hot mills resumed operation Sunday, June 22, at the Farrell works of the American Sheet & Tinplate Co. and will continue indefinitely. Twenty-one of the 30 hot mills of the Farrell plant are in commission.

Unemployment has been reduced to a minimum in the district and managers expect a shortage of workers in the fall. Throughout this section foreigners have left in large numbers, many going East on their way to their native lands, and their exodus threatens to create a serious shortage of unskilled labor.

Arsenal Wants Equipment

The Rock Island Arsenal, Rock Island, Ill., is asking for prices on a list of machine tool, foundry, forge and rolling mill equipment. The machine tools asked for are listed in the Chicago column of the machinery market while the other requirements are summarized below:

One portable pyrometer, suitable for taking temperature of molten brass; one universal sensitive core machine; six worm-geared crane ladles; six 2-ton iron charging cars; four coke charging cars; one air-type burner outfit for drying ladles; one gyratory foundry riddle; one intensive foundry motor-driven sand mixer; 12 portable molding machines; one cupola; one sand blast barrel, 36 in. in diameter and 48 in. long; one core-making machine; two combined jolters and squeezers complete; one rotary table sand blasting machine; one screen dry process dust arrester with fan; one magnetic separator to handle 600 lb. of brass borings; two motor-driven bulldozers; one set of motor-driven plate-bending rolls; two motor-driven centrifugal compressor blowers; one hydraulic high pressure pump; one 300-gal. hydraulic accumulator; one 100-gal. hydraulic accumulator; two small tool forges; two tool-welding furnaces; three tool-treating furnaces; one single belt-driven exhauster; one single belt-driven blower; six down-draft forges.

Waste Material Dealers and Government Scrap

The new headquarters of the National Association of Waste Material Dealers at 1109-1111 Times Building, Times Square, New York, was formally opened June 16 and was followed on June 17 and 18 by meetings of the association at the Hotel Astor. It was voted to organize a credit bureau, the members to furnish the secretary of the association their ledger experiences. At the metal division meeting the present standard of classification for old metals was approved effective for one year from July 1, 1919. It was also voted that it would not be advisable for the association and other reputable dealers to put in a joint bid for Government scrap "owing to the diversified interest of the members of our trade and the fact that it would be very hard to apportion the scrap so that everyone would be satisfied." It recommended, instead, the usual method of individual sealed proposals.

Government Surplus for Sale

Among the larger offerings of Government surplus material through the Ordnance Department are the following: Philadelphia office, 210 tons round bar stock at Eddystone, Pa., bids to be in by 2.30 p.m. July 2; 393 tons manganese steel sheets, E. G. Budd Mfg. Co., Philadelphia, bids to be in June 30; 1200 tons miscellaneous low phosphorus scrap iron, Burnham, Pa., bids to be in July 1; 383 tons round bar stock, Eddystone, Pa., bids to be in July 1; 136 tons bar stock, Eddystone, Pa., bids to be in July 2; Rochester office, 2482 tons steel forgings and 24,000 tons billets, both at American Car & Foundry Co., Depew, N. Y., bids to be in June 30; Detroit office, 2045 tons forgings, Jackson, Mich., bids to be in June 30.

John T. Brady & Co., 103 Park Avenue, New York, have been awarded a contract by the City Commission, Jersey City, N. J., for furnishing and installing a new 72-in. diameter riveted steel pipe line from the Boonton reservoir to Lyndhurst, for the city water system, at a cost of $2,101,067.

Machinery Markets and News of the Works

FAIR DEMAND CONTINUES

Machine-Tool Trade Quiet in East, But Active in Central West

Two Ship Repair Plants to Be Built on Atlantic Coast Will Require Equipment

On the whole, business continues in fair volume, though a slackening in demand is noted in some sections. In the East trade has been relatively quiet for some weeks, as compared with the activity in the Central West.

The Norfolk-Hampton Roads Dry Dock & Ship Repair Corporation has let a contract for dry docks and a ship repair plant to James Stewart & Co., New York. About $2,000,000 will be expended. Considerable machinery will be purchased for ship repairs. The W. & A. Fletcher Co., Hoboken, N. J., has also let a contract to the American Bridge Co. for a floating dry dock and ship repair plant.

Except for orders from the Fellows Gear Shaper Co., Springfield, Vt., but little business of importance was reported in New York last week. The Bethlehem Shipbuilding Corporation is inquiring for a small list of machines for its Sparrows Point, Md., shipyard, and the new Bethlehem subsidiary, the Redington Standard Fittings Co., Redington, Pa., is also buying a small quantity of machine-tool equipment.

In New England builders of textile machinery are placing orders for tools. The United Shoe Machinery Co. is also buying for its Beverly, Mass., and Montreal, Que., plants, and is preparing schedules of tools required for its foreign plants. The Osgood Bradley Car Co., Worcester, Mass., which recently issued a list of tools, will, it is reported, buy from the Government.

At Cleveland orders have been placed by the Haynes Automobile Co., Kokomo, Ind., and the Firestone Tire & Rubber Co., Akron, Ohio, is continuing purchases begun a few weeks ago. Among new inquiries are two from Mexican mining companies.

Chicago dealers report the present rate of business as satisfactory, but there is much disappointment because of the inactivity of the railroads. The Edward Valve & Mfg. Co., Chicago, is inquiring for a number of tools. The Buda Co., Chicago, is contemplating the purchase of more equipment. The Rock Island Arsenal has issued a miscellaneous list of about 25 machines for machine shop and foundry requirements.

There is some improvement in the demand in cranes, though many of the crane companies still are badly in need of work. The Midvale Steel & Ordnance Co. has placed an order for four open-hearth plant cranes with an Ohio company, for delivery at Johnstown, Pa.

New York

NEW YORK, June 24.

In machine tools a moderate amount of business is being done, but orders are small and the demand lacks snap. Sellers who have tried to analyze the situation have come to the conclusion that industry to a large extent is waiting for some phychological event that will start the wheels moving more rapidly. So far as metal-working lines are concerned, the East is quiet to an extent that is not at all in keeping with the improvement that is noted in the Central West. With exceptions here and there, the automotive industry is the only industry that has picked up its full normal momentum. Some believe that the signing of the peace treaty will be stimulating to business. It is certain that expectation of lower prices no longer has first importance as a retarding factor. Sellers are positive that prices will decline no further, this year at least. In a number of instances prices have been readjusted to a higher basis where reductions were made that were more than the trade considered warranted.

Aside from a few fair-sized orders which have come to New York from the Fellows Gear Shaper Co., Springfield, Vt., the past week has been rather barren of important business. The Bethlehem Shipbuilding Corporation is inquiring for a small list of equipment for Sparrows Point, Md., and the new Bethlehem subsidiary, the Redington Standard Fittings Co., Redington, Pa., is placing a few orders.

There are signs of improvement in the demand for cranes. The Midvale Steel & Ordnance Co., Philadelphia, has placed an order for four cranes with an Ohio company for its open-hearth plant at Johnstown, Pa. The E. G. Budd Mfg. Co., Philadelphia, has bought a 15-ton crane from the Niles-Bement-Pond Co. The Milwaukee Electric Crane & Mfg. Co. has sold a 7½-ton gantry crane to W. R. Grace & Co. for export to South America. Dey & Zimmerman, engineers, Philadelphia, are in the market for one 5-ton and two 3-ton cranes. The Roberts Co., Philadelphia, will also close soon on two or three small cranes. The Standard Pill Co. of New Jersey wants two 10-ton and one 20-ton handpower cranes. An inquiry for four overhead electric cranes, issued some weeks ago by this company, is still pending. The Navy Department is expected to award orders soon for 22 large cranes for the naval ordnance plant at Charleston, W. Va.

Application for permission to expend a fund of $450,739, now held in trust, for plant extensions and improvements, has been made by the Newtown Gas Co., Elmhurst, N. Y., to the Supreme Court of New York. The company is a subsidiary of the Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn.

The John Simmons Co., 110 Centre Street, New York, manufacturer of pipe, fittings, etc., has awarded contract to Westinghouse, Church, Kerr & Co., 37 Wall Street, for a forge and blacksmith shop at Nelson and Manly streets, Long Island City, N. Y.

Oscar M. Carter, Inc., New York, has been incorporated with a capital stock of $50,000 by R. C. Perlman, A. P. Saas and M. Berger, 600 Berch Terrace, to manufacture hardware, agricultural implements, etc.

The Mohegan Tube Co., Scott Avenue, Brooklyn, will build a two-story addition to its plant, to cost about $25,000.

The Hoe Mfg. Co., Poughkeepsie, N. Y., has been incorporated with a capital stock of $50,000 by R. Hoe, A. Gregory and M. G. Latimer, 265 Ocean Avenue, Brooklyn, N. Y., to manufacture structural iron and steel.

The Finkel Umbrella Frame Co., 2534 East 177th Street, New York, will build a one-story brick addition, 100 x 200 ft., to cost $75,000, including equipment. Benjamin Finkel is president.

The Charles Alison Corporation, New York, has been incorporated with a capital stock of $25,000 by Charles Alison, 119 West Forty-fifth Street; C. Parrag and L. I. Levenson, 101 West 199th Street, to manufacture machinery, etc.

The American Die & Tool Works, 173 Lexington Avenue, New York, has increased its capital stock from $25,000 to $100,000.

The Steel Equipment Corporation, 25 West Forty-fifth Street, New York, manufacturer of metal office and factory furniture, is planning the immediate erection of a two-story, reinforced-concrete addition at Avernal, near Rahway, N. J., about 80 x 160 ft.

The Pilot Processing Equipment Corporation, Brooklyn, has been incorporated with a capital stock of $100,000 by

A. V. Pruden, M. A. Klass and W. P. White, 170 Marine Avenue, to manufacture machinery for processing foods, and other equipment.

The Fassler & Klein Iron Works, Inc., New York, has been incorporated with a capital stock of $15,000 by H. Fassler, B. D. Klein and O. Frankl, 971 Kelly Street, Bronx.

The George Benda Co., Boonton, N. J., recently incorporated to operate the former German-owned company of the same name for the manufacture of bronze powders, etc., has taken a five-year lease on the property now occupied by the plant to allow for continuous operation.

E. S. Elwood, secretary, State Hospital Commission, Capitol Building, Albany, N. Y., will receive bids until 3 p. m., July 1, for new boilers, stokers, coal and ash-handing equipment, etc., to be installed at the State Hospital, Central Islip.

The Bureau of Yards and Docks, Navy Department, Washington, has had plans prepared for an electric power and light system at Rockaway, N. Y., to cost about $60,000.

The T. C. Wagen Co., Lyndhurst, N. J., has established a new local machine works.

The T. A. Gillespie Co., 50 Church Street, New York, operating the former East Jersey Pipe Works plant, Paterson, N. J., will erect a new foundry, and to equip the plant for the manufacture of engines of Diesel type, motors, screens and filtration equipment, drying apparatus, equipment for chemical plants, and other specialties. The company is said to have secured options on property adjoining.

The Bound Brook Oilless Bearing Co., Bound Brook, N. J., has awarded contract to the Austin Co., Bulletin Building, Philadelphia, for the proposed two-story addition to its works, 100 x 180 ft., thereby bringing the entire plant together at one location.

The Belleville Wire Cloth Co., Belleville, N. J., has been incorporated with a capital stock of $100,000 by E. Livingston, William E. H. Tahiller and Thomas W. Crowley to manufacture wire cloth, etc.

The Atlas Engineering Co., Bound Brook, N. J., has been incorporated with a capital stock of $10,000 by Karl G. Walker, Dunellen, and George L. Wirtz and M. T. Otto, Bound Brook, to manufacture forgings, alloyed steel specialties, etc.

The Advance Rubber Co., 1717 Eighth Avenue, Brooklyn, has filed plans for its proposed one-story plant, 130 x 200 ft., at Harrison Place and Gardner Avenue, estimated to cost, equipped, in excess of $50,000. I. Epstein is president.

The Masback Hardware Co., 82 Warren Street, New York, has been incorporated with a capital stock of $500,000 by E. L. Steckler, E. R. and R. J. Masback, 325 West End Avenue, to manufacture hardware specialties.

The United States Freezer & Machine Corporation, New York, has been incorporated with a capital stock of $60,000 by W. Eppenbach, College Point; A. T. Light, 1266 Morris Avenue, and L. F. McGrath, 1783 Webster Avenue, to manufacture ice-cream freezers, etc.

The American Gas & Electric Co., 30 Church Street, New York, has increased its capital stock from $15,000,000 to $50,000,000.

The Presto Metal Stamping Corporation, New York, has been incorporated with a capital stock of $9,000 by N. Turok, L. Holtzman and L. Offerman, 833 East 170th Street, to manufacture metal stampings.

The Nelson Tool Co., 781 East 142d Street, New York, has increased its capital from $10,000 to $150,000.

The Modern Gas & Electric Appliance Co., 568 Newark Avenue, Jersey City, N. J., has filed notice of organization. Frank Tury heads the company.

Property of the Roessler & Hasslacher Chemical Co., New York, with works at Perth Amboy, N. J., and the Perth Amboy Chemical Works, Perth Amboy, will be sold by Francis P. Garvan, Alien Property Custodian, 110 West Forty-second Street, New York, on July 1.

The Economy Mfg. Co., 183 Essex Avenue, Orange, N. J., has been incorporated with a capital stock of $25,000 by Thomas A. Edison, Jr., B. M. Edison and Edward B. Woodward to manufacture automobile parts.

James Spence, Jersey City, N. J., operating a foundry at 921 Garfield Avenue, has awarded contract to the Clevinger Engineering Co., Thirteenth Street, for a one-story foundry addition, 44 x 60 ft.

The Synthetic Coal & By-Products Corporation, East Orange, N. J., has been incorporated with a capital stock of $11,000,000 by J. B. Bay, B. J. Cummings and Charles Herzog to manufacture coal briquettes, etc.

The Peerless Tube Co., Locust Avenue, Bloomfield, N. J., has filed plans for an addition to cost $10,000.

The Arrow Motor & Machine Co., 397 Market Street, Newark, N. J., has filed notice of organization to operate a general machine works. Anton Felin, 74 Shephard Avenue, heads the company.

The Burnrite Coal Briquette Co., Newark, N. J., is planning for the operation of its new plant on New Jersey Railroad Avenue, now in course of construction, about Sept. 1. The initial works will have a capacity of about 125,000 tons of coal briquettes per year.

C. H. Redman & Co., 48 Dickerson Street, Newark, N. J., manufacturers of hardware, have increased their capital from $50,000 to $150,000.

The Pipe Railing Construction Co., 79 Sixth Street, Long Island City, N. Y., is planning for a new one-story brick plant, 40 x 200 ft., at Newtown, N. Y.

Dudley's Iron Works, Richmond Hill, N. Y., have been incorporated with a capital stock of $20,000 by H. Chandless, W. C. Bates and T. Dudley, 142 West Tenth Street.

The Sherman Brass Foundry Co., New York, has been incorporated with a capital stock of $5,000 by S. Shapiro, H. Danzig and J. Sherman, 226 East 102d Street.

The Fuel Engineering Co. of New York, 106 East Nineteenth Street, New York, has acquired a five-story building, 25 x 92 ft., at 116 East Eighteenth Street, for a new establishment.

The Morse Magneto Clock Co., New York, has been incorporated with a capital stock of $25,000 by E. F. Howard, A. G. and J. S. Morse, 222 Riverside Drive.

The Burtis-Twyeffort Co., New York, has been incorporated with a capital stock of $50,000 by H. F. Herbermann, L. D. Martin and E. P. Burtis, 43 Cedar Street, to manufacture aircraft, aircraft motors and parts.

The Concrete Steel Co., 42 Broadway, New York, has purchased property, 145 x 150 ft., at the corner of Orton Street and Nott Avenue, Degnon Terminal section, Long Island City, as site for a building for steel bar work.

The Anderson Gasometer Co., New York, has been incorporated with a capital stock of $20,000 by I. Anderson, I. and C. Abrahams, 105 Stockton Street, Brooklyn, to manufacture mechanical devices.

The one-story machine shop, 52 x 68 ft., to be erected by George H. Thacher, Albany, N. Y., at a cost of about $16,000, will be used by George H. Thacher & Co., Leonard Street, manufacturers of grate bars, iron and steel castings, etc., for extensions in this department.

The Contra-Pole Electric Co., 1227 Prospect Place, Brooklyn, N. Y., recently incorporated with a capital stock of $100,000, is manufacturing electro-therapeutic apparatus. Mortimer E. Freid, formerly of the purchasing department of the Signal Corps of the Army, is president; Julien de Beaumont, consulting electrical engineer, is first vice-president; Julius Heinecke, general manager Liebig Extract Co. of New York, is second vice-president; Samuel T. Siegel, attorney, 165 Broadway, New York, is secretary, and Arthur Fox, of the Central Textile Co., 150 Madison Avenue, New York, which is financing the company, is auditor.

The Girtanner Engineering Corporation, 1400 Broadway, New York, recently incorporated with a capital stock of $50,000, is manufacturing a standardized conveyor for the removal of steam ash.

The National Tin Corporation, 61 Broadway, New York, is installing additional machinery in its mill and smelter at Hill City, S. D. Simon Lederer is president.

The Estey-Trainor Wire Cloth Co., 270 Union Avenue, Brooklyn, N. Y., recently incorporated with a capital stock of $10,000, will engage in the manufacture of extra fine mesh wire cloth hitherto almost exclusively imported from Europe. Special power looms have been developed by the company for this purpose. Wire cloth of brass, copper, phosphor-bronze, nickel and Monel metal will be manufactured. S. Raymond Estey, president Estey Brothers Co., who has been in the wire cloth and wire work business since 1896, is president; Edward J. Trainor is vice-president; G. Howard Estey, also secretary and treasurer Estey Brothers Co., is secretary and treasurer.

The Save Electric Corporation, 220 Thirty-sixth Street, Brooklyn, manufacturer of electrical goods, has increased its capital stock from $200,000 to $250,000.

John F. Birch, Inc., New York has been incorporated with a capital stock of $10,000 by F. Warner, L. M. and J. F. Birch, 300 East 163d Street, to manufacture machine shop and foundry specialties.

The Anti-Corrosion Engineering Co., New York, has been incorporated with a capital of $50,000 by A. C. Quinn, C. A. Meier and J. M. Stoddard, 128 Broadway, New York, to manufacture apparatus for reducing metal corrosion.

The Linmart Mfg. Co., New York, has been incorporated with a capital of $5,000 by G. P. Martinelli, G. and L. Lito, 975 Home Street, to manufacture needle threaders, sewing machine parts, etc.

The American Gas & Electric Co., 30 Church Street, New

York, has increased its capital stock to a total of $25,000,000.

The Mechanical Tire Co., Mount Vernon, N. Y., has been incorporated with a capital of $10,000 by R. and C. S. Bornheim, and A. Bera, 10 Desbrosses Street, New York, to manufacture tire specialties.

The Surprise Novelty Co., New York, has been incorporated with a capital of $50,000 by T. A. Kinsley, 303 East 142d Street, New York; J. J. Robinson, Huntington, L. I., and L. J. Robinson, 464 Eastern Parkway, Brooklyn, to manufacture machinery and metal specialties.

The Newark Auto Body Co., Newark, N. J., has filed notice of organization with works at 196 Newark Avenue. Stanislaw Mankowski, 291 Bank Street, heads the company.

Philadelphia

PHILADELPHIA, June 23.

The Hess-Bright Mfg. Co., Front and Erie streets, Philadelphia, manufacturer of ball bearings, is having plans drawn for a two-story addition, 40 x 100 ft.

The Philadelphia Roll & Machine Co., Twenty-fifth and Washington streets, Philadelphia, manufacturer of steel castings, etc., has broken ground for a one-story foundry, 46 x 80 ft.

The Niles-Bement-Pond Co., Meadow and Mifflin streets, Philadelphia, has taken bids for a new one-story power house, 40 x 60 ft.

The Cardinal Tool Co., Philadelphia, has increased its capital stock from $100,000 to $200,000. Notice has also been filed of change of name to the S. & J. Tool Co.

The All-Automatic Centrifugal Co., Philadelphia, has been incorporated with a capital stock of $300,000 by F. R. Hansell, Land Title Building, Philadelphia, and N. H. MacFarland, Camden, N. J., to manufacture equipment.

Charles E. McInnes & Co., Land Title Building, Philadelphia, iron and steel products, have increased their capital stock from $10,000 to $100,000.

The Empire Galvanizing Co., Inc., 2507 East Cumberland Street, Philadelphia, has filed plans for a one-story addition, 48 x 75 ft.

The Quaker City Rubber Co., 629 Market Street, Philadelphia, manufacturer of tires, mechanical rubber goods, etc., has awarded a contract to the J. S. Rogers Co., Drexel Building, for its proposed two-story works in the Wissinoming section, 140 x 160 ft., to cost, with equipment, about $100,000.

The American Manganese Bronze Co., Rhawn and Hegerman streets, Philadelphia, has filed plans for a one-story addition, 21 x 65 ft.

M. L. Bastian, 425 Duncannon Street, Philadelphia, manufacturer of air pumps, etc., has filed plans for a one-story brick machine shop, with office building, 20 x 40 ft., and 23 x 60 ft., at Tabor Road and Mascher Streets, for a branch establishment.

The pattern shop to be erected by the Bureau of Yards and Docks, Philadelphia, at the League Island Navy Yard, will be three stories, of brick, 107 x 399 ft., and is estimated to cost about $300,000.

The Atlas Tire & Rubber Co., West State Street, Trenton, N. J., has filed plans for its proposed plant, two stories, 96 x 250 ft., on Enterprise Avenue, to cost $100,000, with equipment. Henry Ludske is president.

The Victor Talking Machine Co., Camden, N. J., is taking bids for an addition to its grinding works, to be known as building No. 13-A.

The National Creeper Co., Camden, N. J., has been incorporated with a capital stock of $100,000 by Charles R. Hunter and John W. Goodwin, to manufacture anti-slipping devices for horseshoes.

The Flexitallic Casket Co., 207 South Second Street, Camden, N. J., is having plans prepared for a one-story plant at Third and Bailey streets, to cost $10,000.

The Camden Motor Corporation, Temple Building, Camden, N. J., has awarded contract to the J. S. Rogers Co., Drexel Building, Philadelphia, for its proposed one-story brick and steel plant, 75 x 300 ft., on the White Horse Pike, Collingswood, N. J., estimated to cost $100,000.

The Baldt Anchor Co., Sixth and Butler streets, Chester, Pa., has broken ground for a one-story addition, 52 x 120 ft.

The Atlantic Motor Truck Co., Paxtang, Pa. has been incorporated with a capital stock of $50,000 by John E. and R. L. Dare, Harrisburg, and S. M. Palm, Paxtang, to manufacture auto trucks.

The Reichard Mfg. Co., Bangor, Pa., manufacturer of agricultural implements and machinery, has commenced the erection of a two-story addition, 45 x 104 ft., to cost $12,000.

The William Meck Mfg. Co., Hazleton, Pa., has been incorporated with a capital stock of $200,000 by Oliver Williams, Charles S. Myers and Clyde Krause, to manufacture metal household utensils.

The Philadelphia & Reading Railroad, Reading Terminal, Philadelphia, will build a one-story power house, 38 x 50 ft., at its works at Reading, Pa.

A new company is being organized by officials of the Bethlehem Motors Corporation, Allentown, Pa., to provide for the merger of that company with the North American Motors Co., Pottstown, Pa. The officers of the new organization will be Arthur T. Murray, president; D. G. Dory, vice-president; H. B. Ball, vice-president; Martin E. Kearn, treasurer, and N. M. Beary, secretary.

The York Haven Water & Power Co., York Haven, Pa., is having plans drawn for a one-story machine shop, 45 x 60 ft., to cost $25,000 equipped.

Buffalo

BUFFALO, June 23.

The Irving Air Chute Co., Buffalo, has been incorporated with a capital stock of $250,000 to manufacture aeroplanes and parachutes. For the present it will specialize in parachutes, and establish a plant for their manufacture. George Waite and George L. Grobe, Ellicott Square Building, are among the incorporators.

The Victor Aluminum Co., Wellsville, N. Y., will build an addition, 52 x 100 ft., to its plant at Wellsville at an estimated cost of $15,000. J. L. Rockwell, Hornell, N. Y., is president.

The Atterbury Motor Car Co., Buffalo, will enlarge its plant at Elmwood and Hertal avenues and the Erie Railroad by the erection of an assembly building, 100 x 450 ft., and a service station, 80 x 180 ft., of brick and steel.

The Ingle Machine Co., 371 St. Paul Street, Rochester, manufacturer of lathes, has increased its capital stock from $300,000 to $1,500,000.

The Stewart Motor Corporation Buffalo, has purchased the plant of the Russell Motor Car Co. at Dewey Avenue and the New York Central Railroad Belt Line, previously devoted to the manufacture of ordnance parts, and will convert it into its main plant for the manufacture of motor trucks. The Stewart Corporation will also continue the manufacture of its trucks at its present plant at Delavan Avenue and the New York Central Belt Line, employing 600 additional men at the new plant.

The Geneva Construction Co., Geneva, N. Y., was low bidder for an additional building, 52 x 254 ft., three stories, to be erected for the Geneva Cutlery Co., at about $82,000.

The Niagara Wallboard Co., 565 D. S. Morgan Building, Buffalo, recently incorporated with a capital stock of $750,000, is arranging for the construction of a plant on Niagara River for the manufacture of wallboard and paper products. J. B. O'Brien is president, and C. C. Hullinger is secretary and treasurer.

The Schiefer Electric Co., Rochester, has been incorporated with a capital stock of $75,000 by H. J. and F. L. Schiefer, Ellwanger & Barry Building, to manufacture electrical equipment.

The Utter Pipe Co., 1602 West Henley Street, Olean, N. Y., has completed plans for repairs to its plant recently damaged by fire.

The Optimo Wheel Corporation, Buffalo, has been incorporated with a capital stock of $250,000 by J. F. Spencer, H. A. Sellers and C. M. Beattie, to manufacture automobile wheels and demountable rims.

The Car Parts Co., Buffalo, has been incorporated with a capital stock of $40,000 by W. and F. X. Senftle, 129 College Street, and H. P. Miller, 310 Ideal Street, to manufacture electric and steam railroad car equipment.

The J. A. Webb Belting Co., Buffalo, has been incorporated with a capital stock of $25,000 by G. L. Grobe, J. A. Webb and G. H. Rowe, to manufacture belting.

The General Street Signal Corporation, Rochester, N. Y., has been incorporated with a capital stock of $75,000 by P. H. Yawman, G. G. Ford and E. J. Dwyer, to manufacture automatic street-signalling devices.

Bastian Brothers, 69 Mount Hope Avenue, Rochester, N. Y., manufacturers of metal novelties, buttons, etc., are considering the erection of an addition for increased production. F. E. Bastian is president.

The Inanout Collet Mfg. Co., Rochester, N. Y., has been incorporated with a capital stock of $15,000 by F. Tardier, J. F. Lobertt and G. Reisinger to manufacture tools and metal specialties.

The Arrow Grip Mfg. Co., Glens Falls, N. Y., is planning a new two-story plant to cost $150,000, and to be equipped

for the manufacture of patented grips to secure automobile chains in place. The company has recently increased its capital stock from $100,000 to $500,000.

The Watson Wagon Co., 20 West Center Street, Canastota, N. Y., manufacturer of dump wagons, trailers, etc., has increased its capital stock from $600,000 to $1,000,000, and has also filed notice of change in name to the Watson Products Corporation.

The Pioneer Welding Co., Syracuse, N. Y., has been incorporated with a capital stock of $10,000 by C. J. Ryan, J. A. Brown and W. J. Lowery, to operate a machine and welding works.

The Larrabee-Deyo Motor Truck Co., Binghampton, N. Y., is planning an addition to cost about $200,000, and to be equipped with machinery, etc. The company recently increased its capital stock to $500,000. E. M. Hanrahan is general manager.

The Hasbrouck Mfg. Co., Binghamton, N. Y., has been incorporated with a capital stock of $500,000 by Charles H. Hasbrouck, Maurice Linden and Norman T. Whitaker to manufacture check-protecting machines.

The B. G. H. Metal Mfg. Co., 106 South State Street, Syracuse, N. Y., is planning a new three-story plant to cost about $25,000, including equipment.

Handley-Page, Inc., Ogdensburg, N. Y., has been incorporated with a capital stock of $5,000,000 by W. H. Workman, J. Frank and S. L. Dawley, 14 Caroline Street, to manufacture aeroplanes, parts, etc.

The Power Specialty Co., Dansville, N. Y., manufacturer of power plant apparatus, etc., is planning for a two-story addition to cost $25,000.

The Aluminum Ware Mfg. Co., East Clinton Street, Elmira, N. Y., has commenced the construction of an addition, 90 x 155 ft., with extension, 86 x 90 ft.

The Kan-Kleber-Veatch Co., Buffalo, has been incorporated with a capital stock of $25,000 by J. A. Kan, G. A. Kleber and L. R. Veatch, to manufacture metal conveyors for flour, feed, etc.

The Eastman Kodak Co., State Street, Buffalo, will build two additions to its plant, consisting of a seven-story factory addition, 94 x 200 ft., and a two-story extension, 90 x 400 ft. Contract for the first has been given to the Fred T. Ley Co., 19 West Forty-fourth Street, New York, and for the second, to the Ferro Concrete Construction Co., Lake Avenue, Rochester. The additions will be for increased capacity.

The Schiefer Electric Co., Rochester, N. Y., has been incorporated with a capital of $35,000 by F. L., H. J. and H. J. Schiefer, Jr., to manufacture electrical specialties.

Baltimore

BALTIMORE, June 23.

Representatives of Rolls-Royce, Ltd., Nightingale Road, Omaston, Derby, England, are reported to have recently inspected sites in Baltimore with a view to locating a plant for the manufacture of automobiles.

The Universal Electric Furnace Co., 1520 Fidelity Building, Baltimore, has been incorporated with $20,000 capital stock to manufacture electric furnaces, reclamation plants, foundry machinery, etc. The incorporators are Raymond M. Glacken, Frederick E. Fisher and Robert E. Kanode.

The Porcelain Enamel & Mfg. Co., O'Donnell and Eighth streets, Baltimore, will build a one-story enameling plant, 110 x 100 ft., to cost $10,000.

The Negley Metal Co., Negley Building, Hagerstown, Md., has been incorporated by Samuel M. and Frank G. Wagaman and Herbert L. Kneisley, to manufacture metal and metal products.

The Bureau of Yards and Docks, Navy Department, Washington, plans to remodel and extend the power plant at Indian Head, Md., and will receive bids for electrical machinery.

The Reinhard Motor Co., Baltimore, is taking bids for a four-story plant, 40 x 110 ft., at Oak Street and North Avenue, to be used for the manufacture of automobiles, parts, etc.

The du Pont Chemical Co., Wilmington, Del., is perfecting plans to dispose of considerable machinery and equipment acquired for war-time operations. The material includes electrical apparatus, tools, mechanical supplies, tanks, structural material, etc.

The National Plating Co., Washington, D. C., has been incorporated with a capital stock of $25,000 by D. F. Brown, George F. Campbell and John F. Conner, to manufacture plated metal products.

A one-story fertilizer works, 100 x 100 ft., to cost about $50,000, with machinery and equipment, will be erected by the Associated Chemical Co., Hagerstown, Md., at Curtis Bay, Baltimore. D. F. Thomas is president.

In connection with its proposed machine shop on Hanover Street, Baltimore, the Standard Oil Co., Pratt Street, will build an engine house and pumping plant, as well as a general service station. The structures will be one story and are estimated to cost $40,000. Bids for construction and materials will soon be asked for.

E. I. du Pont de Nemours & Co., Wilmington, Del., have had plans prepared for a three-story pattern shop, 40 x 112 ft., at Maryland Avenue and Beech Street, to cost about $15,000.

The Pusey & Jones Co., Wilmington, Del., is said to be planning for the sale of its local shipbuilding plant, and to concentrate all activities in the future at its Gloucester City, N. J., yards. As soon as the Government reinquishes control of this latter property, it is planned to extend the yards to provide for increased output. C. Hannevig, president, proposes to construct a number of vessels for Norwegian interests at the plant.

The Norfolk-Hampton Roads Dry Dock & Ship Repair Corporation, Norfolk, Va., has awarded a contract to James Stewart & Co., 30 Church Street, New York, for the construction of its proposed shipbuilding and repair plant, and erection has been inaugurated. The new works will consist of two drydocks of 10,000 and 15,000-ton capacity respectively, with machine shops, foundry, layout shops, forge works, wood-working shops, carpenter shops and other buildings. The plant will be equipped to handle both steel and wood vessels. It is estimated to cost about $2,000,000.

Fire June 9 destroyed a portion of the works of the Morrow Machine Co., Chester, S. C., with loss estimated at $4,500.

The Vibrator Co., Atlanta, Ga., has been incorporated with a capital stock of $25,000 by F. W. Sampson and associates, to manufacture road machinery.

The Southern Asbestos Mfg. Co., Lincolnton, N. C., has been incorporated with a capital stock of $300,000 by C. E. Childs and associates, to manufacture asbestos products.

William B. Lowe and Weldon Fooks, Salisbury, Md., will build a machine and repair shop, to cost about $20,000.

J. O. White & Sons, Winston-Salem, N. C., will build and equip a plant for the manufacture of automobile bodies.

The Eastern Shore Gas & Electric Co., Salisbury, Md., has increased its capital from $750,000 to $1,150,000 for proposed expansion.

The Henry Smith & Sons Co., Fairfield, Md., is planning to close down its shipyard, constructed about two years ago to specialize in wooden vessels for the Government. Contracts for two cargo vessels were recently cancelled.

Young, Klotch & Appel, Inc., 624 North Calvert Street, Baltimore, has been incorporated with $60,000 capital stock to manufacture machinists', plumbers', steamfitters', heating and mill supplies, metals, etc. The incorporators are G. Frank Young, Harry C. Klotch and Charles H. Appel.

The Lanham Cotton Cultivator Co., Empire Building, Atlanta, Ga., is planning a factory for the manufacture of agricultural implements, and will need equipment for foundry, forge shop, machine shop, wood shop and paint shop. Calvin Tichenor is president and general manager.

Chicago

CHICAGO, June 23.

The present rate of business is regarded as satisfactory, although it is admitted that the inactivity of the railroads prevents the return of normal peace conditions. Most dealers, however, are finding June a better month than May, and, in fact, some of them have already booked more business so far than in the entire month of May. The Badger Tool Co., Beloit, Wis., which was recently incorporated to manufacture disk-grinding machinery and equipment, has purchased the machine tool equipment for its plant. The Edward Valve & Mfg. Co., 72 W. Adams Street, Chicago, is inquiring for a number of machine tools, including heavy milling machines, multiple spindle drills and grinding machines. The Nash Motor Co., Kenosha, Wis., has bought a number of turret lathes. This company has been rather a heavy purchaser in the last two months, but has placed its orders in small lots. The Buda Co., 80 East Jackson Boule-

yard, Chicago, is contemplating the purchase of additional tool equipment.

The Rock Island Arsenal has issued a list covering tool and foundry requirements. The machine tools desired follow:

Rock Island Arsenal List

One motor-driven grinding machine fitted with two 18 x 3-in. grinding wheels.
One motor-driven grinding machine fitted with two 16 x 2-in. grinding wheels.
Two electric or air portable grinding machines for use in foundry.
Two inclinable belt-driven power presses with countershaft.
One 15-ton 3-motor electric traveling crane (53 ft. between center of rails).
Two 2-ton electric hoists with chain operated trolley.
Three 200-lb. belt-driven power hammers.
One open throat shear, single shearing capacity 2½ x 6 in.
One motor-driven, hand-feed type, 1½-in. heading machine.
Five motor-driven trimming presses.
Six air chipping hammers.
One rod cutting machine.

The Gulbransen-Dickinson Co., manufacturer of player-pianos, has purchased a tract, 135 x 250 ft., on the north side of West Chicago Avenue, between Sedgwick and Sawyer avenues, Chicago, where it will erect a four-story plant, 90 x 150 ft., with two wings.

The Crowe Name Plate & Engraving Co., Chicago, will build a one-story addition, 87 x 107 ft. and 50 x 56 ft., at 1749 Grace Street, at an estimated cost of $50,000.

A contract has been awarded for remodeling a five-story brewery, 65 x 140 ft., at 422 South Des Plaines Street, Chicago, into a macaroni factory for the Fortune Products Co., formerly the Fortune Brothers Brewing Co. The improvements will cost $30,000.

The Vitanola Talking Machine Co. will construct a plant in South Fifty-second Avenue, south of Nineteenth Street, Chicago, to cost $500,000. Three buildings will be erected, one two stories, 34 x 200 ft.; one four stories, 149 x 181 ft., and a two-story office building, 24 x 35 ft.

The Armstrong Brothers Tool Co., 335 North Francisco Avenue, Chicago, plans to construct a two-story plant, 120 x 152 ft.

Sam H. Rosenthal, 2909 Indiana Avenue, Chicago, contemplates the erection of a one-story machine shop, 70 x 190 ft.

The American Wire Fabrics Co., Continental & Commercial National Bank Building, Chicago, will soon commence the construction of a $1,000,000 plant at Blue Island, Ill.

Montgomery Ward & Co., Chicago, will erect a plant at Springfield, Ill., for the manufacture of farm gas engines. Some time ago it acquired the Field-Brundage Gas Engine Co., Jackson, Mich., which plant will be abandoned in favor of the facilities to be provided at Springfield.

George D. Roper, principal owner of the Eclipse Gas Stove Co., the Trahern Pump Co., the American Foundry Co. and the Vitreous Enamel Mfg. Co., all of Rockford, Ill., has merged these companies into a new corporation to be known as the George D. Roper Co. The new concern will also include the Leader Iron Works, Decatur, Ill., which has been purchased and affiliated with the Trahern Pump Co. A tract of 75 acres has been purchased on the outskirts of Rockford where a foundry will be built with three times the capacity of the two foundries now operated by the old companies included in the merger. Residences for the employees near this plant are also contemplated.

The Duncan Mfg. Co., Freeport, Ill., a Delaware corporation, has been organized with a capital stock of $300,000 to manufacture canning and preserving machinery.

The Walker Adjustable Scaffold Co., Peoria, Ill., has been incorporated with a capital stock of $15,000 to manufacture the Walker Adjustable steel scaffold.

The Decatur Brass Works, Decatur, Ill., has purchased an old shoe factory at Eldorado Street and East Avenue to provide additional space for its expanding manufacturing needs.

The Grand Detour Plow Co., Dixon, Ill., has merged with the J. I. Case Threshing Machine Co., Racine, Wis.

The Moline Plow Co., Moline, Ill., has ordered structural steel for a foundry, 120 x 400 ft., to cost $250,000.

The Benjamin Electric Co., Des Plaines, Ill., is taking bids on the construction of a three-story plant, 66 x 236 ft., which will cost approximately $200,000.

The Carroll Motors Corporation, Petersburg, Ill., has been incorporated with a capital stock of $20,000 to manufacture valve-in-head tractor engines.

The Laurel Motors Corporation, Anderson, Ind., will build a one-story addition, 60 x 125 ft.

The Quality Tire & Rubber Co., Anderson, Ind., commenced the operation of its plant on June 12.

The National Spring & Wire Co., Grand Rapids, Mich., has started the construction of a three-story plant, 85 x 500 ft., to cost $185,000.

The Cedar Falls Brass Foundry, Cedar Falls, Iowa, is planning for the rebuilding of the section of its plant recently destroyed by fire with loss of about $18,000.

The White Lily Washing Machine Co., Davenport, Iowa, manufacturer of electric washing machines, is building an addition to its plant to consist of two units, 30 x 225 ft. and smaller. The extensions will cost about $165,000.

The Cole Storage Battery Co., Chicago, has acquired a building at 2435-39 Indiana Avenue for the establishment of a new plant. The structure will be remodeled to accommodate the new works at a cost of about $10,000.

The Western Screw Mfg. Co., Chicago, has increased its capital from $30,000 to $75,000.

The Great Western Tire & Truck Co., Fourth and Pacific streets, Omaha, Neb., is taking bids for the erection of a new one-story and basement plant, 142 x 150 ft., to cost about $25,000.

The Express Body Corporation, manufacturer of express bodies for automobiles, is erecting a plant at Crystal Lake, Ill.

The Automatic Feeder Co., LeMars, Iowa, has been incorporated to manufacture agricultural machinery. The officers are Dr. M. W. Richey, president; Dr. G. H. Mammen, treasurer and vice-president, and A. L. Kreutzer, secretary.

The Barnes Rubber Co., Chicago, has been incorporated with a capital of $25,000 by Frank E. Barnes, W. P. Coons and Frank H. Thiese, to manufacture rubber products.

New England

BOSTON, June 23.

The notable feature of the machine-tool market in New England is the buying by the textile machinery builders which began several weeks ago, and has now intensified. The demand for textile machinery has increased sharply, for two reasons. One is that the mills are busy and see a great market for their goods, the other that, owing to the adoption of the 8-hr. day for textile mills, which is rapidly extending in this territory, more machinery is necessary to secure the desired output in a single shift of labor. As a consequence every textile-machinery plant is busy, including the works of the Saco-Lowell Co. at Newton Upper Falls, Lowell, Mass. and Biddeford, Me.; the Whitins Machine Works, Whitinsville; Crompton & Knowles Loom Works, Worcester, and the Draper Co., Hopedale, all in central Massachusetts.

The Osgood Bradley Car Co., Worcester, Mass., manufacturer of electric cars, etc., is planning the installation of new machinery to be used for the production of automobile bodies, axles, etc., for the Standard Steel Car Co., Pittsburgh. The equipment will include a number of 16-in. engine lathes, 10-in. speed lathe, four radial drills, several turret lathes, seven milling machines, universal miller, grinding machines, arbor press, surface grinder, double spindle drills, shaper and other machinery.

The Taplin Mfg. Co., New Britain, Conn., manufacturer of hardware products, is planning the erection of a two-story addition to its plant on Arch Street, 50 x 90 ft., to cost about $25,000, including equipment.

The B. & G. Sheet Metal Co., 1107-1115 Westminster Street, Providence, R. I., has arranged to increase its capacity for the production of bed-spring parts. The second floor of the brick building recently purchased by the company will be given over to this department. The first floor will be continued in service for general sheet metal production, and offices. New machinery has been installed.

The Hamilton-Beach Mfg. Co., Racine, Wis., manufacturer of electric motors, electrical goods, etc., is planning the establishment of a new branch plant in New England, location still to be determined. The Chamber of Commerce, Worcester, is negotiating with the company. It is said that the initial works will give employment to about 500 persons.

The Stanley Works, New Britain, Conn., will build an extension, 160 x 160 ft., on North Burritt Street, to cost about $30,000.

O. B. North & Co., 67 Franklin Street, New Haven, Conn., manufacturer of castings, metal buckles, etc., will build a

four-story and basement addition to their plant, 42 x 42 ft., to cost about $11,000.

The Frank Mossberg Co., Attleboro, Mass., has awarded a contract to E. O. Dexter, Wall Street, Attleboro, for the erection of its proposed new one-story machine shop, 60 x 140 ft., to cost, with machinery and equipment about $30,000.

The Union Twist Drill Co., Athol, Mass., has taken bids for the erection of a four-story brick addition, 63 x 190 ft., to be used, in part, for manufacturing work.

Plans are made for a two-story machine shop and a boiler house for James Smith & Son, South Worcester, Mass. The cost will be about $20,000.

The United Shoe Machinery Co. is buying new equipment for its Beverly, Mass., and Montreal plants, and is said to be preparing schedules of purchases to be made soon for its foreign plants.

A pipe shop is to be built at Cranston, R. I., by the General Fire Extinguisher Co., Providence, R. I. It will include two buildings, one three stories, 70 x 120 ft., and the other two stories, 60 x 70 ft., the estimated cost being $75,000.

The New Haven Malleable Iron Co., 385 Clinton Avenue, New Haven, Conn., has in the course of construction an extensive addition to its plant.

The Associate Mfg. Co., New Britain, Conn., has been incorporated with a capital of $100,000 by Charles E. Hadfield, H. C. Kingsley, New Britain, and Walter E. Taft, Providence, R. I., to manufacture automobile equipment and accessories.

The Bureau of Yards and Docks, Washington, is taking bids for the construction of an addition to the structural shop and shipfitters' shops at the Boston Navy Yard. The work is estimated to cost $315,000.

The Fanning Shock Absorber Co., 215 Regent Avenue, Providence, R. I., has filed notice of organization to manufacture shock absorbers for automobile use and other specialties. Walter F. and John W. Fanning head the company.

The Hartford Storage Battery Co., Hartford, Conn., has been incorporated with a capital stock of $50,000 by Roy J. Bessette, Bellani Tromble, Hartford, and Stanley W. Edwards, Granby, to manufacture storage batteries and operate a repair plant.

The Hallden Machine Co., 27 Benedict Street, Waterbury, Conn., has filed notice of organization to manufacture machinery and mechanical equipment. Karl Hallden and John Johnston head the compnay.

The American Graphophone Co., Bridgeport, Conn., has taken bids for the erection of the proposed new six-story, reinforced-concrete addition to its plant on Barnum Avenue.

The American Collapsible Tube Co., Augusta, Me., has been incorpoated with a capital stock of $25,000 by R. W. Farris, C. L. Andrews and D. A. Leland, to manufacture metal tubes, tube making machines and other specialties.

The Jewell Belting Co., West Hartford, Conn., by the recent purchase of four acres of land, has now 25 acres on which building operations are contemplated. The latest acquisition has a railroad frontage of about 400 ft.

Cleveland

CLEVELAND, June 23.

The machine-tool market is holding up well for this season of the year, although some dealers note a little falling off. The volume of business, however, is reported to be a little above normal. A good volume of small scattered orders came out the past week, a large share of it from manufacturers of small automobile parts. The Haynes Automobile Co., Kokomo, Ind., which is building an extension, bought some additional machinery. The Firestone Tire & Rubber Co., Akron, has not yet completed the purchases covered by its lists sent out several weeks ago. Among new inquiries are two from Mexican mining companies, each for several machines for equipping machine shops. Makers of turret lathes report a gradual improvement in the volume of business. They are getting a large number of small orders, mostly for two or three machines.

The Colburn Machine Tool Co., Franklin, Pa., will place contracts shortly for building a new plant on Ivanhoe Road, Cleveland. It purchased a site in Cleveland a year or more ago, but postponed building operations.

The Steel Products Co., Cleveland, has purchased the plant of the Parker Rustproof Co. of America, Detroit, to increase its manufacturing capacity in that city. The plant was built about three years ago, and includes a main building and three smaller structures. An addition is contemplated. It is stated that the Parker company will secure quarters elsewhere.

The Nickel Plate Foundry Co., Cleveland, has placed a contract for the erection of a foundry, 74 x 100 ft.

The B. & M. Cord Tire Co., Cleveland will erect a new plant in Warren, Ohio, for the manufacture of tires, tubes and accessories. It is stated that the works will include two parallel buildings, each 70 x 200 ft., with a connecting unit 50 x 70 ft. It will be three stories, of reinforced concrete. W. E. Myers, Cleveland, is president, and Walter R. Denman secretary and general manager.

The Timken-Detroit Axle Co., Canton, Ohio, has commenced the erection of a machine shop providing 20,000 sq. ft. of floor space. It will be used for machine work on axles.

The Canton Foundry & Machine Co., Canton, Ohio, is in the market for an 18 or 20-in. stroke crank shaper and a 24-in. lathe.

The Smith Typewriter Co., Chicago, is inquiring of Cleveland dealers for punch presses, two plain milling machines, two drilling machines, a 14-in. lathe and a surface grinder.

The American Road Machinery Co., Delphos, Ohio, has had plans prepared for a new plant. It will include an assembling building, 100 x 200 ft.

The Banner Machine Co., Columbiana, Ohio, will enlarge its foundry by the erection of an addition, 60 x 75 ft. Later, an extension to the machine shop is planned.

The Harrold Machine Co., Wooster Ohio, will shortly occupy its new plant, located in a building 36 x 110 ft. It will engage in the jobbing and manufacturing business.

The America Steel Grave Vault Co., Galion, Ohio, will erect an addition to its plant.

Cincinnati

CINCINNATI, June 23.

An active demand for sugar-making machinery from Central and South America is noted and some recent contracts are reported. From the same countries comes a good inquiry for machine tools, a large part of which business formerly went to Europe.

A few sales of lathes to English and French customers are reported, but no orders of size have been placed within the past few days. The domestic call for boring and milling machines is still good and all makers of these machines are busy. Some improvement is noted by the jobbing foundries, but the boiler and tank business is still quite slow.

That local building operations have commenced is evidenced by some of the following permits which have been issued: Dixie Terminal Building, estimated to cost $1,000,000; large plant for the Standard Oil Co., and additions to the Pollak Steel Co., Charles Boldt Paper Mill Co., Globe Wernicke Co., Procter & Gamble Co. and the Worthington Pump & Machinery Corporation.

The John Douglas Co., Cincinnati, maker of sanitary plumbing goods, has had plans prepared for an addition to its plant in Carthage suburb. The proposed building will be 140 x 300 ft., two stories and of brick construction. Part of the building will be devoted to making brass specialties.

The American Frog & Switch Co., Hamilton, Ohio, har commenced work on an addition to its plant, to be used mostly for pattern storage purposes.

C. L. Hartman, 318 Court Street, Hamilton, Ohio, will equip a shop for making and repairing automobile radiators and for other general repair work.

The Dayton Sheet Metal & Lamp Co., Dayton, Ohio, intends to erect a repair shop in the near future.

The Dayton Steel Foundry Co., Dayton, has purchased a tract of land in Edgemont suburb, but has no immediate plans for increasing the capacity of its plant. George Walther is president.

The Central Tool & Die Co., Dayton, has increased its capital stock from $10,000 to $75,000 and will install new equipment in its plant.

It is reported that the Robbins & Myers Co., Springfield, Ohio, maker of motors and electric fans, is contemplating the erection of a plant in Canada. Official confirmation has not yet been received.

It is reported that the Excelsior Drill Co., Springfield, Ohio, has been purchased by the Empire Plow Co., Cleveland, and that the Springfield plant will be greatly enlarged some time this year. The Excelsior Drill Co. will retain its present name. The company makes agricultural specialties.

Work is proceeding rapidly on the large addition to the plant of the American Seeding Machine Co., Springfield, Ohio.

In addition to improvements under way at the Superior Gas Engine Co., Springfield, Ohio, the company expects to

replace its present foundry with a larger and more modern structure.

The Springfield Spring Co., Springfield, Ohio, has awarded contract to the Concrete Steel Construction Co., Springfield, for three additions to its plant that will add 12,000 sq. ft. more floor space. One of the buildings will house a heat-treating department.

The Allen **Motor Car Co., Columbus, Ohio,** has increased its capital stock from $1,500,000 to $3,000,000, and will enlarge its output of automobiles.

The Southern Foundry & Mfg. Co., Owensboro, Ky., recently incorporated with a capital stock of $400,000, will build a new plant for the manufacture of iron and steel castings, pumps and other products. The proposed works will consist of two one-story buildings, 110 x 195 ft. and 45 x 195 ft., and with equipment will cost about $50,000. The company has acquired the Hull Pump & Tank Co. and the Southern Foundry Co. and will merge the two interests. J. J. Trefz is president and general manager.

The Laird Mfg. Co., Louisville, Ky., has been incorporated with a capital stock of $75,000 by J. H. Laird, Jr., and associates, to manufacture machinery and machine parts.

The Western Kentucky Tire Co., Hopkinsville, Ky., has been incorporated with a capital stock of $50,000 by Oscar Goodwin and associates, to manufacture automobile tires.

The Federal Can Co., Commercial Club, Nashville, Tenn., recently incorporated with a capital stock of $100,000, is considering the erection of its proposed new plant. The initial works will have a capacity of about 25,000 cans per day and the equipment is estimated to cost about $23,000. W. D. Trabue is president.

The Memphis Motor Transportation Co., Memphis, Tenn., will build a two-story reinforced-concrete and brick service building and repair works, estimated to cost $55,000.

The Charles Boldt Paper Co., Cincinnati, has taken out a permit for an addition to its plant in East End estimated to cost $30,000.

The Buckeye Marble Co., Cincinnati, has purchased a plant in Ludlow, Ky., which will be fitted up for the manufacture of bank and office furniture.

The Hamilton Caster Co., Hamilton, Ohio, J. A. Weigel, president, has let contract to the C. A. Ervin Co., Hamilton, for a new factory estimated to cost $10,000.

Pittsburgh

PITTSBURGH, June 23.

The Seventeenth Street Garage Co., Publication Building, Pittsburgh, will build a five-story automobile service and machine works, 50 x 100 ft., at Seventeenth Street and Penn Avenue, to cost about $100,000, including equipment.

The Pittsburgh Filter Mfg. Co., Pittsburgh, with works at Oil City, Pa., has filed notice of change of name to the Pittsburgh Filter & Engineering Co.

The new works of the West Virginia Metal Products Corporation, Fairmont, W. Va., recently incorporated with a capital stock of $2,500,000, will include a machine shop, brass rolling mill, gas furnace department, forge shop and other structures, and is estimated to cost about $500,000. The company's site aggregates over 20 acres. The new plant will specialize in brass, bronze and other products. J. E. Watson is president.

The Crucible Steel Co. of America, Pittsburgh, has awarded contract to Toupet, Beil & Conley, Inc., Oliver Building, for improvements in its works on West Carson Street, estimated to cost $150,000.

The addition to the plant of the Wolverine Supply & Mfg. Co., Page and Fontella streets, Pittsburgh, will consist of a five-story and basement building, 70 x 96 ft. Bids for erection will soon be asked. B. F. Bain is president.

The Pittsburgh Crucible Steel Co., Pittsburgh, has received permission from the local Government engineers to construct a new coal hoist, with addition to pumping plant on the Ohio River, near dam No. 7, about 37 miles from the city.

The Safety Mail Crane Co., Charleston National Bank Building, Charleston, W. Va., is planning the installation of equipment, cars and other apparatus at its plant for increased capacity. It recently increased its capital stock to $100,000. A. Bliss McCrum is secretary and treasurer.

The Wheeling Pulverizing Co., Wheeling, W. Va., is now working under double shift at its plant, with forces for day and night. It is planned to increase production. Samuel Windsor is president.

The Keystone Pipe & Supply Co., Butler, Pa., is contemplating the erection of a building for a machine shop, 40 x 60 ft. The company states it will not need any equipment for the new shop.

The National Commercial Refrigerating Co., Youngstown, Ohio, has been incorporated with a capital stock of $600,000 for the manufacture of iceless refrigerators. The product will be made in the plant of the Perry Machine Co.

The Hagan Foundry Corporation, Pittsburgh, has been incorporated with a capital stock of $60,000 to do a general foundry and machine business. The incorporators are George J. Hagan, Perrysville, Pa.; J. M. Hopwood, 1471 Greenmount Avenue, Dormont, Pa.; Howard G. Hammer, 407 Murtland Avenue, Pittsburgh; Harry G. Easton, 530 Maryland Avenue, Oakmont, Pa., and G. W. Williams, 911 Maryland Avenue, Pittsburgh.

Milwaukee

MILWAUKEE, June 23.

Activity in the machine tool trade is increasing, judging from the marked improvement in the number and nature of inquiries. New business actually placed has assumed a better volume than for three or four weeks, and makers and dealers are confident that action upon inquiries will be taken shortly after July 1. Only a few large lot requirements are before the trade, but the small lots or single tool orders form a good total. A distinct feature of the industrial situation in Wisconsin is the tremendous pressure upon wood-working factories, especially those producing veneers, panels and other hardwood commodities.

Labor disputes are gradually disappearing, and in the past week operations in a number of metal-working industries resumed a more nearly normal condition.

The Simmons Co., Kenosha, Wis., manufacturer of seamless steel and other metal beds, box springs, etc., broke ground June 18 for a four-story addition, 90 x 330 ft., of brick and steel. It will be devoted largely to finishing processes and will cost about $275,000.

The Arneson Foundry Co., Kenosha, Wis., manufacturer of heavy brass and iron castings, has broken ground for a brick and steel shop, 72 x 195 ft., as the enlargement of an auxiliary plant established about two years ago on a site separate from its original works, which eventually will be abandoned. The new construction will cost about $40,000, not including new equipment now being contracted for.

The Fox River Tractor Co., Appleton, Wis., a new corporation with a capital stock of $200,000, has purchased a four-acre factory site at Rankin and Commercial streets. The first unit will be 120 x 120 ft., plans for which are in preparation. Work will begin about July 15. Inquiries are being made for tool and other equipment. Frank Saiberlich is president and general manager.

Frank E. Gray, architect, 86 Michigan Street, Milwaukee, is preparing plans for a new gray iron foundry, 110 x 185 ft., of brick and steel, to be erected on Fifty-sixth Avenue, north of Greenfield Avenue, in West Allis, by a new interest to be known as the Motor Castings Co. The identity of the promoters of the project is not revealed for the present. The new concern intends to specialize in manufacturing castings for the automotive industries. The initial investment in building and equipment will be about $80,000.

The F. Blocki Co., Sheboygan, Wis., manufacturer of agricultural implements and tools, has acquired a site at Thirteenth Street and Seaman Avenue for its proposed new plant, costing $40,000. The company recently disposed of its original shop to other interests, but retained part of its equipment.

The Universal Iron & Wire Works, Milwaukee, organized by Herman Koerner, 5405 Washington Boulevard, will build a shop costing about $15,000 at Fifty-ninth Street and Cold Spring Avenue. Contracts have been awarded.

The Standard Steel Corporation, Milwaukee, manufacturer of steel barn and dairy equipment, concrete mixers, etc., is negotiating for a factory site or for the lease or purchase of a machine shop. The company has been operating for a year or more in leased quarters at 491 Virginia Street, but finds itself unable to make needed extension without building or moving into other quarters.

The Barlow-Seelig Mfg. Co., Ripon, Wis., manufacturer of domestic washing machines, awarded the general contract for the erection of a $25,000 addition, 50 x 130 ft., to the Immel Construction Co., Fond du Lac, Wis. The architects are Auler & Jensen, Oshkosh, Wis.

The United States Fertilizer Co., Milwaukee, will build a one-story addition, 65 x 219 ft., at Carrollville (Otjen P. O.), Milwaukee County.

The General Mfg. Co., 1520 Buffum Street, Milwaukee, has taken over the former Schneider Brothers Mfg. Co. plant at Thirty-eighth Street and Villard Avenue, North Milwaukee, and will operate it as a branch plant. The company manu-

factures billiard tables, phonographs and similar goods. Walter H. Schwab is secretary and treasurer.

The International Steel Products Co., Hartford, Wis., is installing some additional equipment and enlarging its force to meet increased demands from automotive industries for gas engine silencers or mufflers.

H. B. Harding, 52 Vanderbilt Avenue, New York City, as consulting engineer of the Milwaukee Harbor Commission, City Hall, is preparing plans for initial construction of the new municipal port terminal on Jones Island, costing approximately $3,000,000. The first units embrace a six-story reinforced concrete warehouse and a one-story brick and steel wharf structure, requiring considerable crane and hoist, conveying, trucking and other fixed and movable equipment. George F. Staal is city engineer, and Herman Bleyer is secretary of the commission.

The Winther Motor Truck Co., Kenosha, Wis., manufacturer of auto trucks, a Delaware corporation, has increased its capital stock from $3,800,000 to $22,000,000.

The Koehring Machine Co., Milwaukee, manufacturer of gas-powered concrete mixers and paving machines, has awarded contracts for the erection of a $25,000 erecting shop addition at its main works, Thirty-first Street and Concordia Avenue. William J. Koehring is president.

The J. R. Hampel Co., Milwaukee, has been incorporated with a capital stock of $20,000 to succeed to the business of J. R. Hampel & Co., 503-507 Enterprise Building, manufacturers of steel dies and conducting a commercial metal-engraving business. Jack R. Hampel is president and manager.

The Fox River Tractor Co., Appleton, Wis., has been incorporated with a capital stock of $200,000 to manufacture tractors and internal-combustion engines. The principals in the enterprise are Frank, Oscar and Edwin Saiberlich, who recently disposed of their interests in the Eagle Mfg. Co., Appleton, manufacturer of gas engines, tractors and other power farm equipment. The Fox River company is negotiating for an existing building but may build a new factory.

The Webster Electric Co., Racine, Wis., manufacturer of small electric appliances and devices for industrial and domestic purposes, will let contracts this week for a two-story brick and concrete addition, 40 x 92 ft., costing $20,000.

The Francis Vaughn Mfg. Co., Milwaukee, has been incorporated with a capital stock of $50,000 to manufacture electrical and other devices, instruments and appliances. Francis Vaughn, 271 Thirty-first Street, electrical engineer, and director of the School of Engineering, is the prime mover in the enterprise.

Indianapolis

INDIANAPOLIS, June 23.

Heavy machinery is in good demand, largely because of the operation at capacity limit of automobile plants. The number of mills and grain elevators incorporated last month was greater than for many years, and business in all machinery used in the milling trade is exceptionally good.

The Atlas Axle Co., Gary, Ind., has been incorporated with a capital stock of $200,000 to manufacture motor trucks and automobile axles. William H. O'Donnell, C. T. Bangs, C. A. Herwig and C. V. Ridgely are directors.

The Colonial Tire & Rubber Co., Anderson, Ind., has increased its capital stock from $75,000 to $2,000,000.

The Betz Motor Truck Co., Hammond, Ind., has increased its capital stock from $25,000 to $50,000.

The William Small Co., Indianapolis, manufacturer of the Monroe automobile, will erect a factory with a capacity of 250 cars a day, at Washington Street and Belmont Avenue. At present the company operates a motor plant at 701 Fulton Street, where the capacity is twenty-five cars per day. The general offices and assembling plant are at 33-37 West Eleventh Street.

The Josam Mfg. Co., Cleveland, will establish a foundry at Michigan City.

The Western Drop Forge Co., has filed a final certificate of dissolution. The company was incorporated March 24, 1906.

The American Metal Products Co. has changed its principal place of business from Indianapolis to Danville, Ind.

The Weidely Motors Co., Indianapolis, has bought the ground and buildings which the plant now occupies at Georgia and Shelby streets. Since leasing the property the company has put in $400,000 worth of equipment, built a switch and made numerous improvements.

The August Bowser Pump Co., Fort Wayne, Ind., has taken over the interests of the Montpelier Mfg. Co. and will manufacture a visible crankless pump. Officers of the new company are G. Max Hoffman, Guy Brack'n and C. J. Scheimann.

The Van Briggle Motor Device Co. will erect a four-story concrete factory at Fifteenth and Capitol avenues, Indianapolis. The building will be 108 x 208 ft., and will cost about $70,000. The officers are: L. H. Van Briggle, president; Frank Hilgemeir, vice-president; Henry S. Rominger, treasurer, and U. X. Wiley, secretary.

In connection with the proposed new sewerage disposal plant at Indianapolis, to be erected by the Board of Sanitary Commissioners, at a total cost of about $750,000, considerable pumping equipment, motors and other apparatus will be installed. Six electrically operated pumping units, with daily capacity of 100,000,000 gal., will be installed at the main pumping station, 45 x 105 ft., while smaller pumps will be installed at the different grit chambers. Charles H. Hurd is consulting engineer.

The Steam Automotive Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture automobiles. The directors are Will H. Whitaker, John A. Whited and William G. Higgins.

The Auto Jack Co. has been incorporated at Terre Haute, Ind., with a capital stock of $10,000. The directors are William E. Lindley, Clarence Ranberger and Henry Streaker.

St. Louis

ST. LOUIS, June 23.

The Helena Compress Co., Helena, Ark., will build an addition to its plant to cost about $75,000.

The Poplar Bluff Gin Co., Poplar Bluff, Mo., will equip a cotton ginning plant requiring about $15,000 worth of machinery. L. A. Dreese is president.

The Springfield Gas & Electric Co., Springfield, Mo., will construct an electric power plant to cost about $750,000.

The Beggs Power & Ice Co., Beggs, Okla., plans the construction of an electric power plant to cost about $100,000.

The Farmers' Mill & Elevator Association, co-operative, of Carnegie, Okla., R. J. Morgan and others interested, is in the market for about $30,000 worth of elevator machinery.

O. J. Southworth and others of Blytheville, Ark., will equip a foundry and machinery shop 25 x 100 ft.

Kayser & Hagedorn, New Orleans, La., will equip a machine shop and foundry at Bellecastle and Tchoupitoulas streets, 150 x 320 ft.

The United Iron Works Co., Springfield, Mo., will increase its capital stock by $500,000 and enlarge its plant capacity.

The Ozark Timber & Stave Co., Little Rock, Ark., E. R. Johnson vice-president and general manager, will equip a plant at a cost of about $100,000.

The F. D. Bearly Lumber Co., Oklahoma City, Okla., F. D. Bearly and others interested, will equip a plant to cost $100,000.

The W. S. Brown Mfg. Co., 2000 Baltimore Avenue, care Liquid Carbonic Co., will erect a three-story and basement building 75 x 100 ft. for the manufacture of brass products.

The Monarch Metal Weather Strip Co., St. Louis, will erect a plant to manufacture metal weather strips and builders' hardware.

The Gridley Motor Co., Kansas City, Mo., will equip a three-story building 100 x 115 ft. for automobile reconstruction and repair work. B. E. Gridley is in charge.

The Ferguson-Hurley Motor Co., Pawhuska, Okla., will equip a machine shop and repair station at a cost of about $40,000.

Detroit

DETROIT, June 23.

Machine tool dealers report a steady increase in demand and a large number of inquiries, mostly from automobile and accessory plants. Industrial construction continues at a rapid rate and continued good business is anticipated during the summer. Labor difficulties have been largely settled, but a shortage of unskilled labor still exists.

The Western Board & Paper Co., Kalamazoo, Mich., will increase its capital stock from $150,000 to $250,000 and erect a new building, 60 x 218 ft. The power plant will be improved with the installation of automatic stokers and a mechanical coal conveyor. A. E. Curtenius is president.

The Ann Arbor Machine Co., Ann Arbor, Mich., has been purchased by Detroit interests and will be known as the Production Casting Co. The property includes a foundry capable of melting 50 tons per day, and four acres of ground. The Detroit office will be at 310 New Telegraph Building.

The Paige Detroit Motor Co., Detroit, Mich., is enlarging

its plant which will give it 15 acres additional floor space. New equipment is being installed rapidly.

The Adolph Leitelp Iron Works, Grand Rapids, Mich., has been purchased by a group of men headed by Charles H. Kelsey, Grand Rapids.

The Owosso Bronze Bearing Co., Owosso, Mich., is contemplating a new plant and machine shop.

The Pontiac Spring Works, Pontiac, Mich., a subsidiary of the Standard Parts Co., Cleveland, and which was recently destroyed by fire, will soon begin work on a new plant 100 x 186 ft. to be erected at a cost of $100,000.

The Traction Engine Co., Boyne City, Mich., has increased its capital stock from $75,000 to $150,000.

The Shuler Axle Co., Detroit, is reported to be contemplating a new plant of larger size. Its capital stock has been increased from $200,000 to $500,000.

The Auto Body Co., Lansing, Mich., has purchased the Acme Engine Co. plant for its own use.

The Triangle Motor Truck Co., St. Johns, Mich., has increased its capital from $100,000 to $200,000 and will build an addition.

The Union Steel Products Co., Albion, Mich., is erecting an addition 80 x 100 ft. and will add 200 men to its force.

The Chelsea Screw Co., Chelsea, Mich., is doubling its plant and equipment.

The Novo Engine Co., Lansing, Mich., manufacturer of gas engines and contractors of pumping outfits will spend $100,000 in additions, one 90 x 260 ft. to be used as a machine shop and the other 100 x 160 ft. as a foundry. They will be one story of steel and concrete.

The Peninsula Brass Works, 85 York Street, Detroit, manufacturer of brass products, will build two one-story additions to its plant, 55 x 120 ft., and 50 x 50 ft., respectively, to be equipped for general brass manufacture and foundry work.

Bids are being taken by the Bohn Foundry Co., 738 Hart Avenue, Detroit, for the construction of its proposed one-story power house, 80 x 100 ft., at Chene and Finley Streets.

The Transport Truck Co., Mt. Pleasant, Mich., has awarded a contract for its proposed new plant to A. W. Stollman, East Armory Street, Champaign, Ill. The works will consist of manufacturing building, power plant and office building, and will cost about $100,000.

Texas

AUSTIN, June 21.

The Invincible Oil Corporation, Fort Worth, with a capital stock of $30,000,000, has taken over the holdings of the Invincible Oil Co., Louisiana Refining Corporation, Gladstone Oil & Refining Co., and the Montrose Oil Refining Co. In addition to two refineries which it has acquired it will build another plant at Houston.

The Matagorda County Gin Co., Bay City, will build a cotton gin to cost $28,000. R. E. Lindsey is a stockholder.

The American Iron & Metal Co., Dallas, has been incorporated with a capital of $50,000. John Garrett is a stockholder.

The Livingstone Oil Corporation, Burkburnett, will build a 2000-bbl. refinery.

The Houston Compress Co., Houston, is planning for the construction of a new one-story machine shop to be used for construction and repair work.

The General Oil & Refining Co., Brownwood, Tex., recently incorporated with a capital stock of $1,000,000, is planning for the establishment of a new oil refinery. L. A. Lane, president, and L. W. Hammond, secretary.

The Standard Farm Tractor Co., Dallas, has been organized to erect a plant with an initial capacity of 1000 tractors per day. James A. Stephenson, American Exchange National Bank Building, is president, and S. C. Smith, manager.

The South Texas Granite & Marble Co., Yoakum, has purchased the quarries of R. H. Downman and William Williams, near Llano, and will install machinery for operating them. It will also equip a finishing plant at Llano. J. W. Cerley, Yoakum, is president.

The Eastland Gas & Electric Co., Eastland, has been incorporated with a capital of $50,000 and will construct an electric light and power plant. The incorporators are H. P. Brelsford, J. H. Cheatham and G. E. Potts, Eastland.

The Miller Cotton Mills, Waco, has been incorporated with a capital of $500,000 and will build a cotton mill. The incorporators are E. R. Nash, Jr., J. M. Penland and C. R. Miller.

The Trinity River Sawmill Co., Houston, will build a lumber mill on the Trinity River to cost about $150,000. H. G. Corn, Houston, is a stockholder.

The North Texas Oil & Refining Co. is building an oil refinery at Greenville at a cost of approximately $250,000.

The Panhandle Produce Co., Plainview, will build a cold storage plant. F. J. Neal, Sweetwater, is a stockholder.

Construction of the first unit of the Dallas Cotton Warehouse will begin about Nov. 1. It will be four stories, steel construction, and equipped with the most modern devices for handling cotton. The warehouse ultimately will consist of three units and will entail an immediate expenditure of $800,000 with an ultimate investment of $2,000,000. J. L. West, Dallas, is temporarily in charge.

The Pilot Knob Gin Co., Austin, has been incorporated with a capital stock of $16,000. The incorporators are W. E. Sassman, Joseph Sassman and F. L. Austin.

The Bureau of Yards and Docks, Washington, has taken bids for the erection of a new naval air station and works at Galveston, to cost about $750,000. Lieutenant L. B. Hyde, United States Chief Engineer, National Insurance Building, Galveston, will be in charge.

The American Art Needle Co., Ferris, Tex., has been incorporated with a capital stock of $125,000 by W. E. Weatherford, Ferris; John B. Stephenson and T. A. Ausley, Dallas, to manufacture needles and other steel specialties.

California

SAN FRANCISCO, June 17.

The shipyards and large machine shops dependent upon them are out of the market for machine tools until appropriations are made by Congress for a continuation of shipbuilding. Dealers, however, are very hopeful for the future. For small machine tools, especially those used in garages, there is a constant demand from all over the State. One machinery house reports that a salesman in northern California turned in orders for 49 machines in 10 days. The demand for mining machinery shows a decided increase and greater activity is noted in the oil fields than for the past five years. The demand for pumps for irrigation plants has also improved.

John McKay, who formerly conducted a foundry in connection with Moore & Noble, under the name of McKay, Moore & Noble, has withdrawn from his former association and is building a foundry, 112 x 200 ft., at Seventeenth and Missouri streets. The name of the company which will operate the new foundry has not been decided upon.

The Acme Engine Co., San Francisco, is preparing to enlarge its plant, and will make additions to its machinery.

The Moreland Motor Truck Co., Los Angeles, maker of 1½-ton trucks, will build a branch factory in Fresno at a cost of $12,000.

The Reeder Welding Co., Sacramento, which was recently incorporated and took over the business formerly operated by William M. Reeder, will enlarge the plant, and is building a foundry in connection therewith.

The Hanford Iron Works, San Bernardino, Cal., has broken ground for the erection of a new one-story foundry, 50 x 50 ft. W. J. Hanford is president.

The Duplex Cushion Tire Co., Los Angeles, has been incorporated with a capital stock of $1,000,000 by B. F. and Wallace A. Coons, F. O. Meyers and George H. Woodruff, to manufacture automobile tires.

The Riblet Mfg. Co., Long Beach, Cal., has been incorporated with a capital stock of $50,000 by Edwin S. and N. M. Beggs, and David T. Keightley, to manufacture carburetors and kindred products.

The Moreland Truck Co., Los Angeles, will erect a one-story building, 75 x 100 ft., at L and Tuolumne streets, Fresno, Cal., to cost about $12,000.

The Automatic Machine Co., 808-10 West Sixteenth Street, Los Angeles, has filed notice of organization to manufacture automobile parts. Allan Ranson and Corbin F. Fitzgerald head the company.

The Avis Hardware Co., Pomona, Cal., has been incorporated with a capital stock of $50,000 by A. B. Avis and Charles E. Otto to manufacture hardware specialties.

The Bureau of Yards and Docks, Washington, has authorized the construction of a new electric power plant at the naval coaling station at California City, to cost about $20,000. Officials at the Mare Island Navy Yard, Vallejo, will be in charge.

G. H. Wadleigh, Los Angeles, has awarded a contract to Leonardt & Peck, H. W. Hellman Building, for the erection

of three-story, reinforced-concrete machine shop and automobile service works, 50 x 170 ft., on Seventh Avenue, near Kip Street, to cost about $32,500.

The Continental Wind Deflector Co., Los Angeles, has been incorporated with a capital stock of $25,000 by R. C. Burk, J. J. Mulkern and E. T. Moses, to manufacture metal wind shields and deflectors for automobile use.

The Vim Mfg. & Sales Corporation, Los Angeles, has been incorporated with a capital of $25,000 by J. S. Wallace, H. C. Wallace and Henry E. Bean, to manufacture machinery and mechanical equipment.

The Pacific Northwest

SEATTLE, June 17.

The wholesale, jobbing and retail trades are good, with considerable activity in manufacturing. The demand for small vessels for cannery and similar use is extremely active, and many of the plants engaged in this line of work have made extensions to meet the needs.

The labor situation throughout the State is excellent, with wages 65 to 70 per cent higher than before the war, and supply and demand pretty well equalized, particularly in eastern Washington.

Considerable interest is being manifested by machinery men in the Northwest in the proposed sale of sawmill properties owned by the United States Spruce Division, which will take place on Sept. 2, when bids will be opened. The properties consist of 75 miles of completed railroads, two large sawmills and about 800,000,000 board ft. of timber. A sawmill with a daily capacity of 400,000 ft., 90 per cent completed, is included.

The Alsea Lumber Co., Eugene, Ore., has been incorporated, and plans the construction of a sawmill at Glenbrook, with a daily capacity of 150,000 ft. E. B. Kingman is president.

The Blewett Tractor Co., Tacoma, has completed organization and will establish a factory for the manufacture of tractors, harvesters and other farming equipment. It has taken over the shops of the West Coast Steel Works, which will be completely remodeled and new equipment installed. The company manufactures a specially constructed tractor and has a capital stock of $100,000. A. R. Blewett is president.

It is reported that the Puget Sound Mills & Timber Co., Port Angeles, Wash., a subsidiary of the Charles Nelson Co., shipowner and mill operator, will build a shipyard at the head of Port Angeles Bay for the construction of ocean-going wooden ships. A. A. Scott is vice-president and general manager.

The Klamath Heating Co., Klamath Falls, Ore., recently organized, plans the erection of a central heating plant to cost $40,000. Sawdust and mill refuse will be used for fuel. The plant will be extended to keep pace with the demands of the section.

The Prince Rupert Dry Dock & Engineering Co., Ltd., Prince Rupert, B. C., which recently leased the Grand Trunk Pacific Railway Co.'s drydock for the establishment of a shipyard with a repair plant as an auxiliary, plans to enter the work on big scale. The drydock has capacity of 20,000 tons, but has lain idle practically ever since its construction in 1916.

Fall Creek Mill Co., Marshfield, Ore., will construct a new tie mill to have a daily capacity of 20,000 ft.

The Hoquiam Sash & Door Co., Aberdeen, Wash., whose factory was recently destroyed by fire, will rebuild on an enlarged scale at a cost of $200,000. The plant will have a daily capacity of 125,000 ft.

The Portland Rubber Co., Portland, has leased property in South Portland and plans the erection of a factory, 50 x 200 ft., of reinforced concrete, and to cost approximately $35,000.

The Supple-Ballin Corporation, Portland, is considering plans to convert its wooden shipbuilding plant into a steel yard. It is estimated that the change will cost about $90,000.

The C. P. Jamison sawmill, Stevensville, Wash., was destroyed in a recent fire. The plant had capacity of 20,000 ft. daily. Some insurance was carried and it is reported the plant will be rebuilt.

The Associated Oil Co. of San Francisco will build at Linnton, Ore., a group of buildings which, with equipment, will cost $250,000. The structures will be of reinforced concrete and steel. A. D. Parker is local manager.

Canada

TORONTO, June 23.

The demand for machine tools and supplies in the Montreal district has shown a slight falling off. The scattered sales made are for early delivery. The volume of business is light and orders are mostly for one or two machines. In Toronto small orders also provide the greatest amount of business. Automobile plants have been fairly active buyers, but the strike is holding back considerable business and sending work into channels that will mean quite a loss to the shops in this district.

The John Wood Mfg. Co., Conshohocken, Pa., has purchased the site and munitions plant from the Holden-Morgan Co., on Coxwell Avenue, Toronto, where it will establish a plant for the manufacture of 200 range boilers per day. About 300 men will be employed at the start. Work on the plant will start without delay.

The Beaver Motor Truck Co., recently formed with a capital stock o $250,000, will establish a plant at Hamilton, Ont., for the manufacture of light 2-ton trucks and is looking for temporary premises pending the erection or purchase of a suitable plant. The machinery required has been ordered. R. Williams and J. Hogue, two Americans, and Oswald Sturdy, Hamilton, Ont., are associated with the new concern.

The Ontario Steel Products Co., Oshawa, Ont., has begun construction on a new motor spring works, the main building of which will be 80 x 360 ft., of concrete and steel. It is expected to be completed by October and in operation by Jan. 1, 1920, and will be known as the Central Spring Co.

Tenders are in for the erection of a factory at Oshawa, Ont., for the Gananoque Spring & Axle Co. A. F. Byers & Co., Ltd., 340 University Avenue, Montreal, are the architects and engineers.

The Casavants Phonograph Co., St. Hyacinthe, Que., will build an addition to its factory and make other improvements costing about $40,000. Samuel Casavant, Girouard Street, is general manager.

Gzias Chauvin, 98 Darling Street, Hochelaga, Que., has the general contract for the erection of a factory at Montreal for the Dominion Carriage Co., Ltd., Sherbrooke, Que., to cost $50,000.

W. H. Cooper, Clyde Building, has the general contract for the erection of a factory at Hamilton, Ont., for the Hoover Suction Sweeper Co., North Canton, Ohio.

The Convertible Tractor Corporation, St. Paul, Minn., plans the erection of a plant at Goderich, Ont. C. F. Megow is vice-president.

The Mount Royal Rubber Co., Montreal, will erect a factory to cost about $100,000. T. H. Reider is president.

Plans are being prepared for the erection of an addition to the foundry owned by Ernest Brothers, Mount Forest, Ont., to cost $10,000. Prices are wanted on material and equipment.

The metal stamping works of the Laval Industrial Co., Laval, Que., was destroyed by fire with a loss of $18,000.

The Ames Holden Tire Co., Ltd., Montreal, has been incorporated with a capital stock of $3,000,000 by Douglas L. McGibbon, Talmon H. Reider, Stephen J. LeHuray, and others, to manufacture automobile tires and accessories, rubber goods, etc.

The Galt Brass Co., Ltd., Galt, Ont., has been incorporated with a capital stock of $500,000 by Arthur W. Holmsted, Room 43, 20 King Street East; Albert R. Kinnear, 20 Spadina Road; Arthur B. Mortimer, and others, all of Toronto, to manufacture stamps, dies, machinery, etc.

The Magnum Holding Corporation, Ltd., Toronto, has been incorporated with a capital stock of $3,000,000 by Melvin G. Hunt, 28 Douglas Drive; Lewie E. Denyes, Easton M. Ansley, and others, to manufacture automobile accessories, valves, machinery, etc.

The Webber Motor Supplies, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Roy H. Webber, 287 Delaware Avenue; Benjamin J. Sutherland, 29 Dearbourne Avenue; Edward L. Middleton, Room 501, 157 Bay Street, and others, to manufacture automobiles, accessories, engines, etc.

The Pierson-Wilcox Electric Co. has been granted a license to carry on business in Ontario with a capital stock of $50,000 to manufacture electrical equipment, machinery, automobile accessories, etc., and has appointed Frederick R. Morris, Fort William, Ont., as its representative.

The General Combustion Co. of Canada, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Milton L. Hersey, Henry H. Vaughan, Walter A. Janssen,

and others, to manufacture electric furnaces, electric heating devices, blowers, pumps, conveying equipment, etc.

The Canadian Safety Fuse Co., Ltd., Montreal, has been incorporated with a capital stock of $300,000 by Gordon W. MacDougall, William B. Scott, Linton H. Ballantyne, and others, to manufacture fuses, explosives, etc.

The Motor Mart of Montreal, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Jacob Nicol, Wilfred Lazure, Joseph S. Couture, all of Sherbrooke, Que., to manufacture automobiles, motors, engines, etc.

The Canadian Hauck Burner Co., Ltd., has established a plant at Port Hope, Ont., to manufacture Hauck oil burners, etc.

At the annual meeting of the Canadian Malleable Iron Co., Owen Sound, Ont., a new board of directors was elected. D. J. Kennedy was made president; M. Kennedy, Sr., vice-president; I. Guttenkunst, manager, and T. D. Kennedy, Mr. Kennedy, Jr., and E. Lemon directors. The offices have been moved to 1020 First Avenue West.

The Northern Aluminum Co., Ltd., 158 Sterling Road, Toronto, will build a factory to cost about $60,000. C. A. P. Turner, 1005 Lindsay Building, Winnipeg, is the architect and engineer.

The Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, will build an addition to cost about $60,000.

Bids will be received by T. L. Church, chairman of the Board of Control, Toronto, until June 24, for belt conveyor and appurtenances, air compressor, stop cocks and kerosene engine.

The Anglo American Wire Rope Co., Ltd., Montreal, has been incorporated with a capital stock of $200,000 by Alexander Chase-Cosgrain, Errol M. McDougall, Leslie G. Bell and others to manufacture wire, wire cable machinery, castings, etc.

L'Heureux Lifeboat Launching Co., Ltd., Montreal, has been incorporated with a capital stock of $250,000 by Frederick Sidgwick and William S. Fletcher, both of Montreal, Elzear M. Dechene, Quebec, Que., and others to manufacture live-saving boats, deck machinery, etc.

The Gidley Boat Co., Ltd., Toronto, has been incorporated with a capital stock of $100,000, by John A. Kent, Room 43, 44 King Street West, Maxwell C. Purvis, Guy M. Jarvis and others to build boats, motors, engines, machinery, etc.

The Sims Improved Rail Anchor Co., Ltd., Toronto, has been incorporated with a capital stock of $100,000 by Mervil MacDonald, Bank of Hamilton Building; Edwin Smily, 136 Tyndall Avenue; Lina Rogers and others to manufacture railroad equipment, machinery, etc.

The Tillers Machinery, Ltd., Regina, Sask., has been incorporated with a capital stock of $50,000 by L. McInnis, T. McInnis, E. McInnis and others, all of Regina, to manufacture farm implements, tools, etc.

The Robert Fitzsimons Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of $50,000, by Robert Fitzsimons, Austin J. Cutler, Kenneth J. Mackenzie and others to manufacture sanitary fixtures and specialties, etc.

The Imperial Steel & Wire Co., Ltd., Collingwood, Ont., owing to a very severe fire in its mills recently, will build new plants for the manufacture of cold-drawn steel wire rods, wire (fine and coarse), wire nails, staples, wire netting, fencing, also a galvanizing plant, a tinning plant, an annealing plant and all other equipment required in wire and nail mills, machine shops, etc.

The Olds Motor Works of Canada, Ltd., Oshawa, Ont., has been incorporated with a capital stock of $10,000 by William S. Morlock, 85 Bay Street; Sydney E. Wedd, 162 Jameson Avenue; Roy B. Whitehead, and others, all of Toronto, to manufacture automobiles, trucks, tractors, farm implements, machinery, etc.

Government Purchases

WASHINGTON, June 23.

Bids will be received by the Bureau of Supply and Accounts, Navy Department, Washington, for supplies for the naval service as follows: Schedule 4116, 1 hand power punch, 1 compression lever riveter, 1 hand power plate bending roll, 1 hand power splitting shear; schedule 4118, flanging machine, seaming machine, and a press, for Washington, bids to be opened June 27.

The Air Service, Procurement Department, will receive sealed bids until 2 p.m., June 27, under proposal 27, for furnishing 2 electric sensitive drills with motors, 12 electric universal drills, 1 grinding machine with motor, 2 drilling machines with motors, 1 radial drill with motor, 3 grinders with motor, 1 hacksaw machine, 6 lathes, 2 arbor presses, 1 straightening press and 1 shaper with motor.

NEW TRADE PUBLICATIONS

Grinding Machines.—Allied Machinery Co. of America, 31 Chambers Street, New York. Catalog. Descriptions and specifications of machines of plain and universal types for grinding cylindrical and conical surfaces; specialized machines for crankshaft, camshaft, ball race, internal grinding and similar work. The various machines are illustrated.

Woodworking Machinery.—P. Pryibil Machine Co., 512 West Forty-first Street, New York. Catalog 19. 192 pages, 5 x 8 in. Devoted to a line of woodworking machinery and supplies. Specifications and illustrations are included of various types of band, jig, circular, rip and swing saws; jointers, lathes, mortisers, sanders, scrapers, shapers, etc.

Fire Extinguisher.—Foamite Firefoam Co., 200 Fifth Avenue, New York. Catalog, with the title "60 Seconds and Out!" Concerned with a solution for extinguishing fire, which distributes itself in the form of a soapy blanket and thus holds carbonic acid gas in bubbles. The liquid is distributed in hand extinguishers, portable tanks and from large tanks by pumps and pipes. The catalog is profusely illustrated, showing fires before and after the use of the solution.

Carbo-Hydrogen.—Carbo-Hydrogen Co., Benedum Trees Building, Pittsburgh. Bulletins 1 to 9 inclusive, devoted to general information, cutting torches and cutting tips, welding torches and tips, regulators, regulators small gages, lead burning outfits, cutting outfits, safety first, and parts for carbo apparatus, respectively. The catalogs are illustrated.

Hydraulic Machinery.—William H. Wood, Media, Pa. Catalog, 63 pages, 11 x 6½ in. Describes a line of hydraulic machinery, including riveting machines, flanging machines, punching and shearing machines, bending press, carbon press, pressure pumps, power pumps, hand-power traveling cranes, jib cranes, mast cranes, valves, etc. The catalog is profusely illustrated.

High Speed Steel, Tool Steel, Seamless Steel Tubing.—Edgar T. Ward's Sons Co., Boston. Three catalogs. Catalog No. O-1 is devoted to a high speed steel recommended for general machine-shop use; No. O-2 to non-shrinking die and tool steel; No. O-3 to cold drawn seamless steel tubing. The steels are described and stock lists are given.

Equipment for Hotels and Public Buildings.—Albert Pick & Co., 208 West Randolph Street, Chicago. Catalog E19, 354 pages, 8½ by 11½ in. Devoted to a comprehensive line of equipment for hotels, public buildings, restaurants, lunch rooms, etc. The articles are pictured, and descriptions and prices are included.

Modified Differential.—M. & S. Corporation, Cleveland. Folder. Pictures and describes a differential device for keeping both wheels of an automobile revolving at the same speed at all times.

Expanding Reamers.—Wetmore Reamer Co., Milwaukee. Bulletin 11. Concerned with an expanding reamer with a left-hand spiral cutting angle of the blade. This tool was described in THE IRON AGE, issue of June 12, page 1584.

Broaching Machines.—American Broach & Machine Co., Ann Arbor, Mich. Leaflet. Illustrates and emphasizes the features of the company's line of broaching machines.

Boiler Feed Regulation.—Northern Equipment Co., Erie, Pa. Catalog. Specifications for the Copes system of boiler feed regulation. This system is described as comprising a continuous feed proportional to the load; heat storage because of variable water level principle; reduction of furnace temperature fluctuations on sudden load changes; constant, unchanging and reliable mechanical performance. Charts and illustrations of the various parts of the mechanism are included.

Overhead Tracks, Trolleys and Equipment.—Roeper Crane & Hoist Works, Reading, Pa. Folder. Illustrations and specifications of overhead tracks, trolleys, switches and turntables.

Fans, Blowers and Heaters.—Massachusetts Blower Co., Watertown, Mass. Bulletin 51. Descriptions and illustrations of fans, blowers, heaters and air washers for heating, ventilating, purifying, cooling and air conditioning.

Leather Belting.—Graton & Knight Mfg. Co., Worcester, Mass. Folder. Concerned with the company's leather for belting, said to be especially adapted for use in iron and steel mills, forging plants, etc.

Cost of Heating of Steel.—W. S. Rockwell Co., 50 Church Street, New York. Bulletin 42. Reprint of an article, "Cost of Heating of Steel," presented before the American Drop Forge Association by B. K. Read. A discussion with data of material heating costs in connection with drop forging work.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price	6.10c
Burden's best bar iron, base price	6.30c
Swedish bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.37c
1 to 6 in. x ⅜ to 1 in	3.37c
1 to 6 in. x ¼ and 5/16	3.47c
Rods—⅝ and 11/16	3.42c
Bands—1½ to 6 x 3/16 to No. 8	4.07c
Shapes:	
Beams and channels—3 to 15 in.	3.47c
Angles:	
3 in. x ¼ in. and larger	3.47c
3 in. x 3/16 and ⅛ in.	3.72c
1½ to 2½ in. x ⅛ in.	3.52c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in.	3.52c
1 to 1¼ in. x ⅛ in.	3.57c
⅞ x ⅞ x ⅛ in.	3.62c
¾ x ⅛ in.	3.67c
⅝ x ⅛ in.	4.47c
½ x 3/32 in.	5.17c
Tees:	
1 x ⅛ in.	3.87c
1¼ in. x 1¼ x 3/16 in.	3.77c
1½ to 2½ x ¼ in.	3.57c
1½ to 2½ x 3/16 in.	3.57c
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ⅜ in. and larger	4.00c
Open-hearth spring steel	6.00c
Standard cast steel, base price	14.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.17c	——
Nos. 22 and 24	5.22c	6.55c
No. 26	5.27c	6.60c
No. 28	5.37c	6.75c
No. 30	5.57c	——

No. 28, 36 in. wide, 10c higher.

Wood's Keystone Hammered, 18-24 gage, 9¾c; 26-28 gage, 10¼c.

Galvanized

	Per lb.
No. 14	5.60c
No. 16	5.75c
Nos. 18 and 20	5.90c
Nos. 22 and 24	6.05c
No. 26	6.20c
No. 27	6.35c
No. 28	6.50c
No. 30	7.00c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per lb.
Bright basic	5.25c
Annealed soft	5.25c
Galvanized annealed	6.00c
Coppered basic	6.00c
Tinned soft bessemer	7.25c

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	21c to 22¾c
High Brass Wire	21c to 22¾c
Brass Rod	19½c to 21c
Brass Tube	31¾c to 36c

Copper Sheets

Sheet copper, hot rolled, 16 oz., 25½c. to 28c. per lb. base.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
			80 lb.	$8.30	$8.05
			90 lb.	8.40	8.15
			100 lb.	8.55	8.30
IC	$11.30	$10.05	IC	8.80	8.55
IX	13.50	12.00	IX	10.00	9.75
IXX	15.25	13.75	IXX	10.95	10.70
IXXX	17.00	15.50	IXXX	11.90	11.65
IXXXX	18.75	17.25	IXXXX	12.85	12.60

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.50
IC	8.65
IX	9.65
Fire door stock	11.50

Tin

Straits pig	74c to 75c
Bar	80c to 85c
American pig, 99 per cent.	70c to 72c

Copper

Lake Ingot	18c to 19c
Electrolytic	17½c to 18½c
Casting	17c to 18c

Spelter and Sheet Zinc

Western spelter	8½c to 9c
Sheet zinc, No. 9 base, casks	12c; open 13c

Lead and Solder*

American pig lead	6c to 6½c
Bar lead	7½c to 8½c
Solder ½ & ½ guaranteed	45c
No. 1 solder	40c
Refined solder	34c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c
Commercial grade, per lb.	50c

Antimony

Asiatic	9½c

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 37c to 39c

Old Metals

The market is firm. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	15.25
Copper, heavy and wire	14.25
Copper, light and bottoms	12.00
Brass, heavy	9.00
Brass, light	7.50
Heavy machine composition	14.50
No. 1 yellow rod brass turnings	8.50
No. 1 red brass or composition turnings	12.00
Lead, heavy	4.62½
Lead, tea	3.75
Zinc	4.25